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THE OPIUM ASSAY QUESTION.

By Alfred Dohme, Ph.D.

Perhaps no chapter of Pharmaceutical Chemistry has received more attention and been more discussed than that of opium and its analysis. Scarcely a journal appears nowadays that does not contain an article or two upon how opium can "best" be assayed and just how the method of Prof. X— or Mr. Y— is inaccurate and unreliable. There is a certain sameness about articles written about opium assaying—a sameness that becomes monotonous in course of time and causes the reader to become perplexed, if not disgusted, as the result of a perusal of them. Invariably the author picks all other methods to pieces and then proposes an "original new" method which gives better agreeing results and is much more easily manipulated than any yet proposed. As a matter of fact, we possess not a single accurate and exact method of analysis of any plant or of any of its organic constituents. Plant analysis, as Dragendorff aptly remarks, has not yet reached the stage which enables us to say, without an interrogation point at the end of our sentence, that this plant contains just so much of that constituent and no more. Plant analysis is as yet synonymous with approximate analysis, and until our knowledge of the chemistry and physiology of plant life and growth has advanced considerably beyond its present status, it is doomed to continue to be approximate analysis. Hence, no method is accurate as, for instance, is the determination of sulphuric acid as barium sulphate, or of hydrochloric acid as chloride of silver, and if one of them does give better agreeing results and such as are nearer the mean of those obtained by all

other methods, this is due most probably to the fact that in this particular method the sources of error are more nearly counterbalanced than in the others. It was, hence, from a purely impartial and critical standpoint that I undertook to compare several of the most prominent methods for assaying opium.

Those decided upon were the methods of Flückiger, Squibb and of the U. S. Pharmacopœia—being virtually the ammonia versus the lime method. The drugs examined were Smyrna opiums from the houses of Merck and of Gehe & Co., the former having been ordered and received by myself while still at the laboratory of Geh. Rath Fresenius at Wiesbaden during the past summer, and the latter kindly given me by my instructor, Professor Flückiger, here at the laboratory. Both samples were finely powdered and dried at 80° C. for five hours. All three methods were begun at the same time and the directions for each closely followed throughout. In both cases the determination by the U. S. P. method was completed long ere the others were, while Squibb's method, due to its more frequent washing and slower filtering, took up the most time. Just at this point I should like to protest against the impracticability and uselessness of weighing liquids, which so often is found in methods of plant analysis and nowhere else. As I see the matter there is not one point in its favor, unless perhaps, that it is an inherited custom, while there are certainly many points against it. Firstly—it occupies more time; secondly—accurate balances are not arranged for weighing liquids, and inaccurate balances (or moderately accurate balances, as their owners would probably prefer to term them) certainly make the weighing less accurate than measuring; and thirdly—weighing, even on accurate balances, is seldom, if ever, more accurate than measuring with graduated glassware which every druggist does, or at any rate, should possess. The U. S. P. method, besides being the shorter, required less attention and care than the other methods and, as the figures will show, gave the most satisfactory results. As this is all that is required of a method of analysis I can see no reason why the present officinal process should be altered, for no other now in use is more exact and at the same time as practical. The morphine obtained in every experiment with the U. S. P. method was undoubtedly the whitest and purest of all the crystals obtained by any method. There was less washing necessary than in either Squibb's or

Flückiger's method and at the same time the filters and crystals upon them were beyond any question of a doubt the purest and whitest. Here follow the figures:

	Merck Opium.	Gehe Opium.
Flückiger, ...	9·52 p.c.	13·95 p.c.
Squibb, ...	11·67 p.c.	16·52 p.c.
U. S. P., ...	11·44 p.c.	15·00 p.c.

As these figures show, Flückiger's method gave the lowest and Squibb's the highest results, which facts are, however, very easily explained and as follows: in Flückiger's method the result depends very much, if not entirely, upon the amount of shaking that is done, as Dieterich has conclusively shown, and as I only shook for about half an hour steadily, with continued shaking at intervals of ten minutes for two hours more, it is very probable that all of the morphine did not separate out. The high figures obtained by Squibb's method are undoubtedly to be explained by the impurity of the resulting products, which fact could readily be detected by the naked eye, as they were invariably very dark colored Despite all the washing that they were subjected to, they never once were even approximately near being colorless and besides invariably dissolved in lime water only in part and gave as a result a very dark colored solution. It was found that continued washing would not remove the impurities, for long before the crystals and filter paper showed any signs of becoming decolorized, the wash water ran through absolutely pure and colorless. In both cases the morphine obtained by the U. S. P. method dissolved completely in lime water and gave a pure, limpid, clear solution, while that obtained by Flückiger's method, although it gave a colorless solution in lime water, yet left a small residue amounting to several milligrams and consisting of narcotine, as did the residue obtained in Squibb's method. This would indicate that in the presence of alcohol and water, the ether does not completely dissolve all of the narcotine.

MORPHINE PICRATE.

Inasmuch as this salt of morphine had not yet been described, and the similar salt of strychnine is practically insoluble in water and hence enable us to determine the alkaloid as strychnine picrate, it was made by treating a solution of morphine hydrochlorate with a slight excess of picric acid, in the hope that it, too, might prove to be insoluble and thus facilitate somewhat the method of deter-

mining morphine. Recrystallized from alcohol it crystallizes in groups of fine yellow needles arranged most peculiarly in the shape of warts, which grow one along-side of the other and hang from the surface of the liquid looking much like plaits of hair. The salt melts or, better, decomposes without detonation at 157° C. It differs from the corresponding salt of strychnine, however, in not being insoluble in either water or alcohol as determinations of its solubility gave the following results:

In distilled water at 13° C.—15·6975 grams of a saturated solution yielded 0·031 grams of morphine picrate (dried at 100°) which gives a solubility of 1 part in 500 parts of water.

In absolute alcohol at 13° C.—7·2422 grams of a saturated solution yielded 0·009 grams of morphine picrate (dried at 100°) which gives a solubility of 1 part in 800 parts of alcohol.

This being the case it is, of course, impossible to make use of the salt as a means of determining morphine.

LABORATORY OF PROF. FLÜCKIGER,
UNIVERSITY OF STRASSBURG,
February 17, 1891.

THE CHEMISTRY OF OPIUM.

BY ALFRED DOHME, PH.D.

At the instigation of my esteemed instructor, Prof. Flückiger, I undertook to study the phenomena which present themselves when opium is dialyzed. When the investigation was first begun the prime object in view was to determine, if possible, to what cause the acid reaction of aqueous extract of opium was due and how morphine was combined in the drug. As the work progressed it was decided to study the relative quantities of the chief constituents of the drug and, if possible, then draw conclusions in regard to how these are combined in nature in the same. In how far this has proven successful the conclusions will show; suffice it to say here that the work was a very long drawn out and laborious one and not one of the results obtained with the ease which one is accustomed to in inorganic analysis. As is the case in every operation with drugs and plants of any kind, the numerous coloring matters, gums, resins and the many other amorphous sub-

stances of which we have but little definite knowledge save that they exist to worry the chemist, very much hindered the work in many respects. Dialysis was chosen inasmuch as by means of it it was hoped that all of the looked-for constituents would pass into solution while little or none of the undesired would follow suit. Besides this no operation was to be performed with the opium which might change the nature of combination of its various constituents. It had been observed by Flückiger that there is, in all probability, enough sulphuric acid present in opium to combine with nearly all of the alkaloids present. Whether or not, however, it is sulphuric acid or meconic acid that is in excess and hence free, as yet remained an open question. It is certainly very probable that if it were a question of which acid would first and most readily be neutralized by the bases, that sulphuric acid would be the one, although mass action might cause some of the meconic acid to be in combination at the expense of sulphuric acid. With this aim in view 50 grams of finely powdered opium were rubbed together with distilled water and the paste washed completely into a dialyser consisting of an oval gutta-percha ring covered with heavy parchment paper and immersed in a dish containing about five litres of distilled water. This was allowed to stand covered thus for nearly three months, the water being changed about twice a week. Even at the expiration of this time, sulphuric acid and alkaloids could be detected in the dialysate and as my time here was limited and the semester was rapidly drawing to a close, it was decided to finish the operation more expeditiously by exhausting the opium remaining in the dialyser with cold water. This last extract was treated separately although exactly in the same way as the greater portion. While this operation was quietly progressing, a complete analysis of the ash of opium (the same as was used for dialysis) was made in order thus to get a definite idea of the mineral constituents of the drug. Accordingly, 20 grams of finely powdered opium were carefully and gradually ignited in portions in a platinum dish. It was found very difficult to completely incinerate the drug, so that even after heating the dish to a bright red heat the resulting ash was quite dark, in fact nearly black. It was found very advantageous at this point to treat the mass with a little cold water and evaporate this off on a water-bath and, finally, again carefully heat and glow it over a free flame. By repeating this operation several times an ash was obtained which was very

nearly pure white in color. When weighed it yielded 3·89 per cent. of the original substance:

Platinum dish + ash, ... = 61·6052 gr.
" " alone, ... = 60·8281 gr.

Hence, ash alone, ... = 0·7771 gr.
and 20 : 0·7771 = 100 : x whence x = 3·89 per cent.

A complete analysis, the details of which it would be useless to enumerate here, gave the following results, these being expressed in per cent. of the ash weighed:

	Per Cent.
SiO_2,	11·14
P_2O_5,	8·07
SO_3,	28·39
Fe_2O_3,	1·98
CaO,	9·04
MgO,	8·31
K_2O,	30·19
CO_2, HCl and not determined constituents,	2·88
	100·00

The dialysate was next evaporated down in portions to about two litres upon a water-bath and the resulting deposit, consisting of coloring and other organic matter, as well as some calcium meconate, removed by filtration. The filtrate reacted acid to litmus and in it were detected morphine, narcotine, narceine, codeine, sulphuric and meconic acids. It was next acidified with hydrochloric acid, and after heating on the water-bath was treated with a boiling solution of barium chloride in excess. After standing over night the resulting barium sulphate was filtered off and washed out with hot water containing hydrochloric acid until it was white. It was then dried, ignited and weighed and yielded, with the portion that was similarly treated separately, the following figures:

Portion I—$BaSO_4$, ... 2·9236 grams.
Portion II— " . . . . . 0·3920 "

Total, ... = 3·3156

Equivalent to { 1·3945 grams H_2SO_4, or 1·1384 " SO_3 }

The filtrate from this precipitate was neutralized and precipitated in the cold with ammonia which was added in slight excess. After standing for several days the precipitated alkaloids were filtered off

and the filtrate again made ammoniacal and left stand, when more alkaloid was precipitated. This was continued until the resulting filtrate no longer gave a reaction for alkaloids. The various precipitates were then filtered off and dried at 80° C. to constant weight and regarded as the total alkaloids of the opium taken. They were then treated for several days with an excess of lime-water until this took up no more alkaloid. The remaining alkaloids were then filtered off, washed with slightly ammoniacal cold water and dried at 80° C. They were then weighed and regarded as narcotine. The results obtained are given below:

Porcelain dish + alkaloids (total), ... = 24·3023 gr.
" " alone, ... = 14·0465 gr.

Hence, total alkaloids found, ... = 10·2558 gr.
Narcotine (weighed on tared filter), ... = 4·3631

giving as the final result:

Morphine, 5·8927 grams { equiv. to 11·79 per cent.
Narcotine, 4·3631 " { " to 8·73 " "

The other alkaloids present in opium, such as codeine, narceine, papaverine, etc., were not considered separately as they, in all probability, play the same rôle with respect to the acids present as does morphine.

In a separate experiment with the same opium, which was dialysed in the same manner as that just described, the dialysate was shaken with amyl alcohol, the latter then separated and shaken in a separating funnel with a solution of sodium hydroxide for half an hour, and the alkaline layer separated as before. This was then acidified and a few drops of it, when brought in contact with a drop of a solution of ferric chloride, gave a beautiful wine-red color, thus showing the presence of meconic acid. Inasmuch as experiments with morphine and narcotine meconates had shown that neither of these are taken up by amyl alcohol, it follows that the free acid in the dialysate was meconic acid.

CONCLUSIONS.

(I) That the free acid in aqueous opium extracts is meconic acid.

(II) That the silica in opium is present in the form of sand, and that the lime is most likely combined with phosphoric acid, while the magnesia and potash are probably combined with organic acids and some sulphuric acid.

(III) That there is more than enough sulphuric acid present in

opium to combine with all of the alkaloids present save narcotine; for the 5·8927 grams of morphine, narceine, codeine, etc., found, require only 1·0133 grams of sulphuric acid to form the salts $(C_{17}H_{19}NO_3)_2\ H_2SO_4$, etc., whereas there were found in all 1·3945 grams of sulphuric acid; and

(IV) That hence, morphine, narceine, codeine, etc., are contained in opium combined with sulphuric acid as sulphates, while narcotine, at best only a feeble base, is combined in part, at least, with meconic acid, of which there is also some present uncombined in the drug.

In conclusion, I should like to take this occasion to thank Prof. Flückiger for the kind assistance and advice I obtained from him while working in his laboratory, and also Mr. J. E. Gerock, his excellent and kind assistant.

LABORATORY OF PROFESSOR FLÜCKIGER,
UNIVERSITY OF STRASSBURG,
February 17, 1891.

KOCH'S LYMPH AND ITS DILUTIONS.

BY JOSEPH W. ENGLAND, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, March 17.

There is probably no remedy of modern times which has excited such widespread interest in medical circles and amongst the laity as the lymph or liquid introduced by Dr. Robert Koch, of Berlin, for the treatment of tuberculous conditions. The reasons for this interest are plain, in view of the difficulty of treatment, general fatality and wide distribution of the disease, and any remedy which promises relief is destined to receive a welcome royal. Indeed, such is the demand for a cure that, with the advent of a new remedy, the wish being father to the thought, greater properties are often claimed for the agent than by the discoverer himself. This is notably true of Dr. Koch's lymph.

The lymph has been used but limitedly in this country, for the reason that it has been very difficult to procure, and, if procured, it has been in limited quantities only. In Europe its use has been quite extensive, more especially in Germany. As to its exact therapeutical value, medical opinion is somewhat divided. It is generally admitted, however, that its introduction will open up a new world of therapeutical possibilities, in directing general

attention to medication with micro-organisms and their products and, for that reason alone, it is most valuable. Whether it will be of permanent service in relieving tuberculous conditions, time and trial only can tell. Its best field of usefulness seems to be in lupus and in the early stage of tuberculoses. In the advanced stages it is positively contra-indicated, as is also, in the opinion of some physicians, its use as a means of diagnosis.

The word "lymph" is a misnomer. It does not stand (in this connection at least) for the lymphatic fluid of the body, as might be supposed. It is a reddish-brown, viscid, glycerin-and-water solution; having a heavy narcotic odor, somewhat resembling that of opium, miscible with water in all proportions; neutral in reaction; reasonably permanent on exposure to air; sp. gr.[1] 1·150; and, in stronger solutions, becomes turbid upon the addition of alcohol.

With a *neutral* 10 per cent. solution, neither mercuric chloride, potassio-mercuric iodide, nor iodine and potassium iodide gave any precipitates, platinic chloride gave a yellow precipitate; silver nitrate gave a white precipitate, which, on boiling with strong nitric acid was partially dissolved; leaving a whitish residue entirely soluble in AmHO, and a yellow solution; barium chloride, and ferric chloride exerted no change; Fehling's solution showed no evidence of glucose, but its addition gave the pure violet reaction of albuminoids (which will be referred to later); lead oxyacetate solution gave a white precipitate soluble in excess; the flame test revealed sodium and not potassium.

If, however, following L. Reuter,[2] we use a slightly *acid* (HCl) 10 per cent. solution of the lymph, we get a heavy reddish-brown precipitate with iodine and iodide of potassium; likewise a precipitate with platinic chloride, and a faint one with potassio-mercuric iodide. Mercuric chloride causes no precipitation. Ferrous sulphate solution, slightly acidulated with H_2SO_4, yielded no precipitate on standing, indicating the absence of gold salts. This experiment was subsequently confirmed by adding auric chloride to the neutral solution, as well as to the acid. In both cases precipitates were formed.

[1] My experiment confirms the figures of Mr. Henry Campbell, in Brit. Med. Jour. 1891, 76.—J. W. E.

[2] Pharm. Ztg., 1890, 747, vide A. J. P., 1891, 19.

As regards Mr. Reuter's view "that the lymph is a neutral solution of the hydrochlorate of an alkaloidal body, possibly a ptomaine," since auric chloride, and iodine and potassium iodide solutions each gave precipitates with the acid solution, the statement seems doubtful, since solutions of iodine and potassium iodide, mercuric chloride, and potassio-mercuric iodide—all alkaloidal precipitants—do not precipitate the *neutral* solution. Further, Brouardel and Boutiny's test for ptomaines (of potassium ferric cyanide and ferric chloride), fails to reveal their presence.

Strong nitric acid by the "contact method," or the dilute acid solution placed in a very narrow tube and the upper part heated, showed the absence of albumen. The absence of peptones was indicated by the Biuret test (of $KHO,CuSO_4$ in *very dilute* solution, etc. Red or pink color, in the absence of albumen).[1] With the Biuret test,[2] however, the pure violet color of albuminoids (with no tinge of pink or red), was produced, just as it had been previously obtained with Fehling's solution.

To summarize, then, there are present sodium chloride, water, glycerin and albuminoids, the latter probably in the form of certain micro-organisms or their products, or both, and proteids. If the lymph is made by "culture" and there are proteids present for the growth and development of the colonies, it would presuppose that the finished product should also contain peptones, but the chemical reaction for peptones is negative. It seems, then, probable that the peptones, necessarily present if the "culture" has contained proteids and micro-organisms, have been removed by precipitation with sodium chloride or some peptone precipitating compound and filtered. Hence, the negative result for peptones with the Biuret test in the finished product. It is probable, also, that the proteids have likewise been removed; leaving a saline, watery, glycerin extract of the micro-organisms, or their products, or both.

The lymph used in the above examination was obtained by the Philadelphia Hospital through Minister Phelps, U. S. Minister at Berlin, and was kindly furnished me by Dr. D. E. Hughes, Chief Resident Physician of the Philadelphia Hospital.

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[1] Clinical Diagnosis, Jaksch and Cagney, p. 211.

[2] It may be of interest to state that the Biuret test, in the absence of albumen, produces a red or pink color when peptones are present; a violet color when albuminoids exist, and a reddish-violet color if there be present both albuminoids and peptones. Albumen alone gives a blue color.

The usual dose of the pure lymph is from $\frac{1}{1000}$ cc. to $\frac{1}{100}$ cc., administered hypodermically, but the lymph itself is never used. In its place is employed one of three solutions—a 10 per cent., a 1 per cent., or a $\frac{1}{10}$th of 1 per cent. solution. The medium strength is in greatest demand. The weakest strength is used for children. If a solution becomes turbid on standing it is unfit for use.

For the purpose of administration, Dr. Koch has devised a special hypodermic syringe, having a rubber-bulb and a stop-cock at one end, to which is attached a glass tube ground at both ends (one end for the bulb attachment; the other for the hypodermic needle), having graduated upon it 1 cc. in ten subdivisions. This syringe is also very convenient with which to make the solutions.

All apparatus used in preparing the dilutions should be first thoroughly washed with a solution of carbolic acid ($\frac{1}{200}$), and the syringe cleansed first with absolute alcohol and then with the carbolized solution. For making the latter use boiled, distilled water.

The formulas of the several solutions are as follows:

LYMPH SOLUTION NO. 1.

Lymph, ... ½ cc.
Carbolized water ($\frac{1}{200}$), ... 4½ cc.

With a pipette of 1 cc. capacity (graduated into $\frac{1}{10}$) measure ½ cc. of the lymph, and deliver it into a 5 cc. measure. Wash pipette twice with the diluting liquid, add the washings to the lymph contained in the graduate and dilute the whole to 5 cc.

Label: Lymph Solution No. 1. (*10 per cent.*)

Each $\frac{1}{10}$ cc. equals, ... $\frac{1}{100}$ cc.
Or 1 cc. equals, ... $\frac{1}{10}$ cc.

LYMPH SOLUTION NO. 2.

Lymph Solution No. 1, ... ½ cc.
Carbolized water ($\frac{1}{200}$), ... 4½ cc.

Mix as before.

Label: Lymph Solution No. 2. (*1 per cent.*)

Each $\frac{1}{10}$ cc. equals, ... $\frac{1}{1000}$ cc.
Or 1 cc. equals, ... $\frac{1}{100}$ cc.

LYMPH SOLUTION NO. 3.

Lymph Solution No. 2, ... ½ cc.
Carbolized water ($\frac{1}{200}$), ... 4½ cc.

Mix as before.

Label: Lymph Solution No. 3. ($\frac{1}{10}$ *of 1 per cent.*)

Each $\frac{1}{10}$ cc. equals, ... $\frac{1}{10000}$ cc.
Or 1 cc. equals, ... $\frac{1}{1000}$ cc.

As regards the method of administration of the lymph, a letter by Dr. Libbertz accompanies it. Mr. Frank X. Moerk has kindly translated it as follows:

DIRECTIONS FOR USING LYMPH.

The lymph can be kept for a long time without decomposing. The dilutions, however, speedily spoil and become turbid; turbid solutions must not be used. To prevent decomposition of the dilutions they must be heated to boiling, after each opening of the container. Dilutions made with phenol solutions do not require this treatment.

The remedy is to be used subcutaneously, preferably between the shoulder blades or the hips. The injections are best made with Koch's syringe, sterilized by rinsing with absolute alcohol; abscesses by this procedure are positively prevented. In using an ordinary Pravaz's syringe, sterilize it as completely as possible by repeated washing with absolute alcohol; in this case, however, abscesses are not as certainly prevented.

The progress of the body temperature must be observed before the injection as well as after it. It is necessary to take the temperature every three hours for at least one day before the injection, and to provide for its continuance during the course of treatment. The injections should be made in the early forenoon, so that the effect on the temperature, noticeable after a few hours, may be followed the same day.

For the first injection 0·1 to 0·2 cc. of the 1 per cent. dilution should be used; in the following days the dose is carefully increased; if fever above 38·5° C. (101·3° F.) follows, the dose (previously given?) is repeated or even omitted; if no fever or a slight one follows, the dose may be increased 0·1 to 0·2 cc. of the 1 per cent. dilution. When the dose has reached 1 cc. (1 per cent.) or 0·1 cc. (10 per cent.) it may, with proper observation of the temperature, be increased from 0·1 to 0·2 cc. of the 10 per cent. dilution. As a rule, the *daily* dose should not exceed 1 cc. of the 10 per cent. dilution; only in exceptional cases is it necessary to increase to 2 cc. of that dilution. The injections are then repeated with intervals of one or more days until the symptoms disappear.

In the treatment of lupus (if not very extensive) adults may be injected at the first with 0·1 cc. (10 per cent.) solution, the injection to be repeated when necessary. This is also the case in articular, bone and glandular tuberculosis.

The proper comparison of the lymph can only be guaranteed if the lymph be obtained directly from the undersigned.

[SIGNED] DR. A. LIBBERTZ.

HEUCHERA AMERICANA, *LINNÉ.*

BY JOSIAH C. PEACOCK.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 85.

This subject was taken up at the suggestion of Prof. H. Trimble, and was worked under his instructions. The root used was collected

in the vicinity of the Falls of Schuylkill, Philadelphia, Pa. A collection of the root was made in the early part of July, 1889, and subjected to proximate analysis in December of the same year. The following constituents were found:

	Per cent. amount.
Fat, wax and caoutchouc,	·65
Gallic acid (trace) and resin,	·56
Tannin (5·55 per cent.), glucose (3 per cent.) and phlobaphene (?),	20·72
Glucose (6·09 per cent.), saccharose (3·17 per cent.), mucilage and tannin (·26 per cent.),	9·84
Albuminoids (1·5 per cent) and extractive soluble in dilute alkalies,	3·50
Calcium oxalate (1.2 per cent.) and extractive soluble in dil. hydrochloric acid,	4·85
Starch,	4·67
Moisture,	8·08
Ash,	6·14
Cellulose, lignin and loss,	40·99
Total,	100·00

The absolute alcohol extract was completely soluble in hot water, but the aqueous solution so obtained almost immediately deposited a heavy red-brown precipitate, which amounted to over one-half the total extract. The solution in water was red before and after this deposition. The corresponding extract of root collected in October was reddish-yellow, soluble in cold water, giving a solution of the same color, and was permanent for a reasonable time. The tannin was determined in the clear supernatant liquid; the color was carried down in the precipitate of the gelatin compound. This tannin gave with ferroso-ferric salts a dark blue precipitate. No phlobaphene was found in the alkaline (NaOH) extract. Starch was determined in a separate portion of the material.

Tannin.—To ascertain the amount of this constituent, several collections of the drug were made at different seasons of the year, and the estimations made while the material was fresh, that is, on the day following the collection. The method of procedure was to make a decoction of the drug, to precipitate the tannin in this with gelatin in the presence of alum, to dry and weigh this precipitate after washing it with boiling water to remove alum, and to take 54 per cent. of this as the equivalent of this tannin in gallotannic acid. The average of three closely agreeing results was used. All the

decoctions were of a light chocolate color, with a slight fluorescence, and of a radish-like odor; but varied in the strength of their acid reactions. The filtrates from the precipitates of the gelatin compound were in all cases clear and colorless. In the following chart, the first column marked "moist" indicates the percentage of tannin found in the drug as collected. That marked "dry," in the second column, indicates the percentage of tannin calculated for the absolutely dry drug. The third column indicates the percentage of moisture found.

Time of collection.	Per cent. of tannin.		Moisture.	Starch calculated for absolutely dry.
	Moist.	Dry.		
July 1, 1889, ...	—	—	—	5·17
May 1, 1890, ...	2·41	9·33	74·18	
June 20, 1890, ...	3·98	10·68	62·74	
June 25, 1890, ...	4·16	12·75	67·38	
August 6, 1890, ...	5·18	17·91	71·08	
October 5, 1890, ...	4·73	19·66	75·95	4·64
January 15, 1891, ...	6·91	13·65	49·40	
March 10, 1891, ...	4·63	14·75	68·60	13·62

The lot of June 20th was collected from plants that had not bloomed; around these were found plants that were in bloom. The collection of June 25th consisted of roots from plants that had flowered, as the calyx remnants were found, and the inner whorls were absent. No special influences were connected with the May, August and October drug. The roots gathered on January 15th were dug from frozen ground and had been under snow for some time. The leaves were adhering. The lot of March 10th was also dug from frozen ground but had not experienced recent snow.

For the examination of the tannin, some of the drug was exhausted with commercial ether, the solvent recovered by distillation; the extracted matter dissolved in water, fractionally precipitated with lead acetate, the first precipitate rejected, the others washed, suspended in water and decomposed by hydrogen sulphide, the lead sulphide removed by filtration and the tannin solution concentrated by distillation under reduced pressure. The concentrated solution was shaken several times with stronger ether, separated and distilled to dryness under the above conditions. The material so obtained

was dark brown, porous, very slowly soluble in cold, readily in hot water; these solutions were strongly acid. Cold water containing a small amount of ammonia readily dissolved it giving a dark red solution, from which an excess of acetic acid precipitated a dark brown substance.

A one per cent. solution reacted as follows:

Gelatin,	reddish yellow precipitate.	Ferric chloride, (acid)	dark green precipitate.
Tartar emetic, and with	same.	Ferric chloride, (neutral)	dark blue precipitate.
Ammon. chloride,	same.	Ferric acetate,	same.
Lead acetate,	drab precip.	Ferrous sulph.,	no change.
Copper acetate,	brown precip.	Fehling's solution,	reduced.
Ammon. molybd, and nitric acid,	dark green precipitate.	Silver nitrate,	no change; when boiled reduced to metallic state.
Lime water,	dark purple precipitate.	Copper sulphate, and with	no change.
Uranium acetate,	red brown precipitate.	Ammon. hydrate, in excess.	dark brown precipitate.
Potass. bichrom.,	dark brown precipitate.		

Gallic Acid.—The moist roots, finely cut, macerated with stronger ether, yielded to this solvent but a small amount of extract, which when treated with water showed this acid to be present as follows: In roots collected, in warm weather, faint traces, and in those gathered in colder seasons more, although at no time amounting to more than distinct traces. The same treatment of the July, 1889, lot, at the present time, showed considerable to be present.

Starch.—This constituent was determined in the original drug, and all of the three estimations, mentioned above, were carried out at the same time. The great difference in amount between October and March drug was also noticed under the microscope. That collected in March showed the cells loaded with starch granules, while in that collected in October the cells were almost free from starch.

WHAT IS ARISTOL, AND HOW IS IT MANUFACTURED?

By George M. Beringer, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, March 17.

The search for a substitute for iodoform, possessing similar antiseptic properties, but devoid of its disagreeable odor, has enriched our materia medica with several other valuable iodine products, such as iodol, soziodol and bismuth sub iodide. Recently attention has

been directed to the iodine products of the phenols, resulting in the introduction in practice of an iodine compound of thymol under the proprietary name of Aristol. And it has also been discovered that similar products may be produced with phenol, naphthol, resorcin, salicylic acid and carvacrol. It must, however, be borne in mind that none of these contain so large a percentage of iodine as iodoform, and to possess equally valuable properties must in a measure depend upon the known antiseptic value of their organic bases.

The exact composition and mode of manufacture of aristol has not been published by the manufacturers, they contenting themselves with the statement that it was an iodine derivative of thymol and differed from the formulas and products published by various investigators.

J. Messinger and G. Vortmann, who first reported upon these iodine derivatives of the phenols (*Ber.*, xxij, 2012, see *Journal Chem. Society*, 1889, 1150), stated that their product, obtained by adding a solution of iodine in potassium iodide to a solution of thymol in potassium hydrate, was a brownish-red amorphous compound having the *composition of di-iodo-thymol* ($C_{10}H_{12}I_2O$). This compound, they state, retains its color many months when preserved in the dry state in the dark, but decomposes on exposure to light or moisture with the liberation of iodine into a yellow compound, an iodine derivative, most likely of dithymol. This yellow substance is also formed when the brownish-red compound is boiled with water, aqueous alkalies or sulphites or thiosulphites. The same writers subsequently proposed the adoption of this reaction for the volumetric estimation of phenols,[1] and state that one molecule of thymol requires four atoms of iodine for complete precipitation, a

[1] The process given for phenol is as follows: One molecule of phenol requires 6 atoms of iodine. 2 to 3 gm. of phenol is dissolved in solution of NaHO using at least 3 molecules NaHO. It is diluted to 250 to 500 cc. and 5 or 10 cc. of this solution is taken in a flask maintained at about 60°; then $\frac{n}{10}$ iodine solution is added until a dark yellow solution is obtained, which on shaking forms a bright red precipitate. After cooling the solution is acidified with dilute H_2SO_4 and diluted to 250 to 500 cc., filtered and an aliquot portion (100 cc.) titrated with $\frac{n}{10}$ sodium thiosulphate solution by which excess of iodine remaining is determined. The amount of iodine used $\times$ factor $\frac{93{\cdot}78}{759{\cdot}24}$ = 0·123518 gives the quantity of pure phenol.

For Thymol: Iodine precipitates from alkaline solution of thymol a red

statement which is confirmed by my experiments. Dr. F. Goldman (*Apoth. Zeit.*, 1890, 45; also, AMER. JOURN. OF PHARMACY, 1890, 129) states that aristol or *di-iodo-dithymol* is made by the action of a solution of iodine in potassium iodide upon a solution of thymol in sodium hydrate. The same statement is made by Dr. Eichhoff (*Pharm. Journ. and Trans.*, 1890, Febr., page 601).

The writer could find no published chemical examination of the commercial aristol, and several other iodine compounds with thymol are possible. And, as the precipitate obtained by adding iodine in potassium iodide solution to an alkaline thymate solution was so different, it became necessary to make some examination of the article supplied under that name before answering the first part of this query.

An original package of that supplied by the "Farben Fabriken" Company of Elberfeld was obtained, and upon examination showed the following characteristics: a pale yellowish red amorphous powder, easily soluble in ether, chloroform, benzene and petroleum ether, and less soluble in alcohol. It was insoluble in water, but yielded to that liquid a slight trace of chloride. Heating it on the water bath it became lighter in color and at 65° C. it gave off sufficient iodine vapors to blue a piece of filter paper moistened with starch solution. On heating at 100° C. for 4 hours it lost 6·4 per cent. and after 6 hours 7·4 per cent. It darkens at 124° to 126° C., shrivels into a dark mass at 134° to 136° C. and fuses at 158° C., and yielded on incineration nearly one per cent. of ash, which reacted for sodium chloride.

1 grm. intimately mixed with pure calcium oxide, and a combustion made thereof, yielded, upon precipitation, ·745 grm. silver iodide, corresponding to 40·25 per cent. of iodine. A combustion

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brown flocculent precipitate whereby for 1 molecule thymol used 4 atoms of iodine are required. The used quantity of iodine is $\times \frac{149{\cdot}66}{506{\cdot}16} = 0{\cdot}2956772$.

Process 0·1 to 0·3 grm. thymol is dissolved in NaHO (4 mols. for each molecule of thymol) treated with $\frac{n}{10}$ iodine solution. The solution acidified and the remaining iodine determined as in the phenol investigation.

β-naphthol gives under similar conditions a dirty green precipitate, and is determined by the same method. The factor is likely $\frac{143{\cdot}66}{379{\cdot}62} = 0{\cdot}37843106$.

The alkali used must be nitrite free.—*Chem. Zeitung*, 1890, page 291.

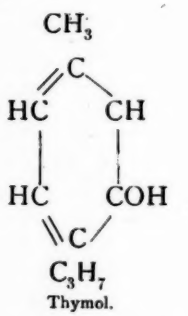
made with sodium carbonate yielded ·777 grm. silver iodide corresponding to 41·98 per cent. of iodine. Heating ·2 grm. in a sealed tube with silver nitrate and nitric acid (Carius' method) ·155 grm. silver iodide was obtained corresponding to 41·87 per cent. of iodine.

On repeating the experiments of Messinger and Pickersgill (*Ber.* 23, p. 2761, see *Jour. Chem. Soc*, 1890, 1403) and reducing aristol by dissolving in ether and adding solution of potassium hydrate in alcohol and then zinc dust gradually in small quantities and boiling on the water-bath in a reflux apparatus, and finally boiling off the alcohol, maintaining the bulk of the liquid by the addition of water; the liquid thus obtained was filtered from the excess of zinc, acidulated with sulphuric acid, and extracted with ether. The product was purified by redissolving in alcohol, and yielded a compound possessing a peculiar odor of thymol almost phenol-like. It gave no reaction with ferric chloride, and although impure corresponded fairly well with the properties assigned to *dithymol*.

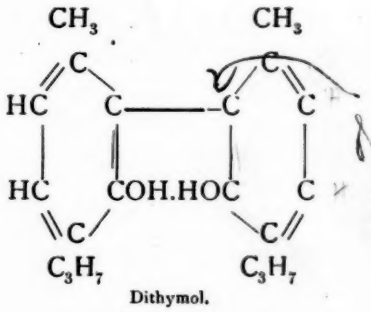
Dithymol was first obtained by Dianin (see *Jour Chem. Society*, 1882, 130), by treating thymol with neutral ferric chloride or sulphate or ferric alum, the reaction being represented by the equation

$$2C_{10}H_{14}O + Fe_2(SO_4)_3 = C_{20}H_{26}O_2 + 2FeSO_4 + H_2SO_4$$

The relation between thymol and dithymol is graphically represented by



Thymol.



Dithymol.

Goldman (loc. cit) states that aristol is di-iodo-dithymol $C_{20}H_{24}O_2I_2$, containing 45·8 per cent. of iodine. Accepting his formula, there should be, by calculation, 46·15 per cent. of iodine. But the manufacturers drying the product at a low temperature to prevent decomposition, there must be some water retained, and the loss on heat-

ing on the water-bath, determined above as about 6·4 per cent., must be due mainly to water. Allowing two equivalents of water to be in combination, there would be present 6·14 per cent. of water and 41·96 per cent. of iodine, figures that closely agree with the results obtained by me, the average of the three determinations of iodine being 41·36 per cent. From these experiments we are compelled to accept the statement that aristol is a biniodide of dithymol, in which the hydrogen of the hydroxyl groups is replaced by iodine and is represented by the formula $C_{20}H_{24}I_2O_2.2H_2O$.

A formula based upon the experiments of Messinger and Vortmann would be:

Thymol,	15 gm.
Soda,	20 "
Iodine,	50·8 "
Potassium iodide,	66·4 "

The thymol and soda are dissolved in 250 cc. water. The iodine and potassium iodide in 1,000 cc., and gradually added to the first solution, continually stirring. The precipitate is collected, washed and dried. The precipitate obtained by this formula was at first of a purple-brown color, but while drying gradually became lighter in color, until when dry it was of the same yellow-red color as the commercial article. The filter on which the precipitate was collected and dried was stained with iodine. The filtrate gave no indication of free iodine, and a portion acidulated and extracted with ether yielded no thymol, showing that the reaction was complete. It is not believed that this is the process adopted by the manufacturers, as it requires the use of a large amount of iodide of potassium and iodine. The greater portion of the latter being lost in the drying of the precipitate.

The following formula is offered as an economical process:

Thymol,	15 gm.
Soda,	20 "
Iodine,	6·35 "
Potassium iodide,	8·3 "
Solution of chlorinated soda, a sufficient quantity.	

The thymol and soda are dissolved in 250 cc. of water. The iodine and iodide of potassium are also dissolved in 250 cc. of water and the two solutions mixed, resulting in an opalescent solution with a dis-

tinct green tint, the slight precipitate first formed being redissolved. Solution of chlorinated soda is now added gradually while stirring until no further precipitation is produced, and a slight excess is indicated by the odor. About 650 to 700 cc. will be required. The precipitate, a light red brown in color, is collected, washed and dried, by spreading on bibulous paper in a suitable room where it can be protected from the light, at a temperature not exceeding 50° C. The filtrate showed the absence of iodides in any quantity, and a portion acidified and extracted with ether yielded no thymol. The yield by this and the preceding formula was about 29 grm., corresponding in color, melting point and solubilities with the aristol in the market and closely approximating the theoretical yield 29 285 grm. calculated from the formula $C_{20}H_{24}I_2O_2.2H_2O$.

The thymol used in this formula must be free from essential oil or thymene or there is produced some iodoform in the reaction which remains as a contamination of the finished product. As most of the commercial thymol contains a small portion of hydrocarbon it must be first purified, which is easily accomplished by percolating the powdered thymol with a small quantity of purified benzin which dissolves of course a portion of the thymol as well as the thymene, but it can be recovered by evaporation of the solvent and used for other purposes. The solution of chlorinated soda used should contain no excess of chlorinated lime, and in its preparation for this purpose, it is advisable to use an excess of sodium carbonate as an excess of this latter salt does not affect the product.

In Répertoire de Pharmacie, 1890, page. 355, M. Louis Boulé furnishes the following formula for the preparation of aristol: Crystallized thymol, caustic soda and potassium iodide each 5 grams, dissolved in 50 cc. of water and then poured into 250 cc. concentrated solution hypochlorite of soda. It will be observed on calculating the quantities used that there is an insufficient amount of iodine supplied by the potassium iodide to furnish a product of the above composition. In the absence of sufficient iodine a certain amount of the thymol combines with the chlorine. Upon adding solution of chlorinated soda to an alkaline thymate solution there is precipitated a compound of a pinkish tint soluble in ether, alcohol and chloroform and precipitated from its alcoholic solution by water. The filtrate from this precipitate yields but a slight trace of thymol upon acidifying and extracting with a solvent. A similar

product is obtained by passing chlorine into an alkaline solution of thymol until there is a decided excess of chlorine.

These are evidently chlorine compounds with thymol, most likely a dithymol compound, and worthy of further investigation.

ANTIKAMNIA.

By F. W. Haussmann.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, March 17.

Samples of this new antipyretic, for which extravagant virtues have been claimed, were recently distributed among a number of physicians by a St. Louis firm. Its basis is stated to be an amido derivative of benzol, which differed from the numerous recently introduced organic antipyretics and anodynes by leaving no ill after-effects. Headache, neuralgic afflictions, rheumatism, etc., were claimed to be beneficially influenced by the specific, and the above statements have induced a number of physicians to prescribe the article.

Several peculiarities in its physical condition, especially its taste and behavior to solvents, gave rise to the suspicion that a mere mixture of several compounds was under examination. It occurs in a white, dry powder, resembling antipyrine to some extent, without odor and of a somewhat burning taste. When thrown into water or placed on the tongue a slight effervescence is observed. About 50 per cent. of it is soluble in cold water, and both the physical and chemical behavior prove this to be mainly bicarbonate of sodium.

The solution effervesces strongly with dilute acids and when a drop is held in the flame of a Bunsen burner, the characteristic yellow sodium color is observed. The acid, which produces the effervescence stated when thrown into water, is believed to be tartaric, as the tests for the latter answer readily.

Phenol compounds, such as salicylates or antipyrine, are not present, neutral ferric chloride giving no color reaction. The portion left undissolved by water, was already from its physical peculiarities suspected to be antifebrin or acetanilid. Chemical examination readily proved this to be the case. When heated with caustic potassa or soda in the presence of chloroform the characteristic isonitrile odor is developed. Heated with strong nitric or sulphuric

acid the odor of acetic acid is evolved or if an addition of alcohol is previously made, that of acetic ether.

Alkaloids, especially caffeine, which was at first suspected, were not found, no reagents giving any indication.

We may sum up the compound to have about the following composition:

Antifebrin or acetanilid,	47 parts.
Bicarbonate of sodium,	50 "
Tartaric acid,	3 "

Incidentally may be mentioned, that the mixture can be prepared for about 10 cents per ounce, for which the manufacturers charge $1.10.

POLARIZATION WITHOUT A POLARIZER.

By P. H. Van der Weyde, M.D.

To the Editor of the American Journal of Pharmacy:

Under this heading, Mr. H. M. Wilder published in The American Journal of Pharmacy the announcement that he "accidentally made a quite useful discovery." It appears that the study of one of the most interesting branches of physics, the polarization of light, has thus far been lamentably neglected, as proved by the fact that this announcement is now going round the press without remark or comment (see Scientific American Supplement, No. 793, and other scientific papers) wherefore I may be allowed to give to your readers the following items of information.

The discovery that certain regions of the atmosphere polarize the sunlight was made by Arago in 1809; he went further, and determined the regions of maximum and minimum polarization, the latter he found 11½° above the sun a little before sunrise and a little time after sunset, and also 11½° above the opposite point of the heavens, while the maximum polarization takes place in a circle or belt situated exactly 90° from the sun as centre.

As the position of this polarized circle of light is continually shifting with the position of the sun, and is only sufficient for practical purposes when the mirror of the microscope reflects the light from this belt, microscopists found difficulty to obtain sufficient light from it, and it never came in use; in consequence, it appears at present to be entirely forgotten.

As soon as I came in possession of a polarizing microscope, 50

years ago, I tried to make use of this then well-known property of the atmosphere, but soon gave it up for reason of the loss of time involved by the continual readjusting of the position of the instrument, and especially by the want of sufficient sky surface to which most residents of large crowded cities are subject. I therefore devised in its place a very cheap, steady and reliable polarizer, consisting of a piece of plate glass, ground and blackened at the back surface, and attached under the stage at the angle for maximum polarization which for reflection from plate glass is 56½°. This device is equally good by night or day, clear or clouded sky, the only precaution is to place the microscope in such a position that the light reflected by this fixed mirror is directed through the axis of the tube. It is as good a polarizer as a large Nicol prism, and far better and more available than the blue sky.

Hagenbach observed that not only the light of the blue sky is polarized, but also that light which the sun sends through such layers of air as are between distant mountains and our eyes. The polarization is especially strong when the background is dark and the intervening layers of air not too small. When the distant mountains become indistinct by the action of the reflected light of the intervening layers of air, the mountain may again be very distinctly seen, when a Nicol prism or analyzer is placed before the eye piece of the telescope. He tested this by looking during a clear day at the Alps from such a great distance that they could no more be distinctly seen, even by a telescope; they became at once clearly and sharply defined, when he placed a Nicol prism before the eye piece, or even before the naked eye, rotating the prism until the proper position was obtained.

It is unfortunate that in clouds and fogs no polarization takes place, otherwise a Nicol prism would enable us to make our vision penetrate in certain directions. Experiments have been made, but, of course, without success.

Polarization of Pure Water.—It was suspected that water, when pure enough, would polarize the light according to the same laws as the pure blue atmosphere; this was found to be actually the case by Soret, who experimented in the pure blue waters of the Swiss lakes, using for that purpose a tube, with a piece of plate-glass fixed water-tight on the lower end, while the upper end carried a Nicol prism. It is essential in this experiment that the

lake is so deep that the bottom cannot be seen, and also that the surface is smooth, as otherwise the solar rays do not enter the water parallel. When the sun does not shine on the water the polarization is very imperfect, as then the light enters it from many different sides, and even when the sun shines the polarization is imperfect for the same reason, because light enters it from various directions, while the blue atmosphere is only illuminated by the great luminary, the sun.

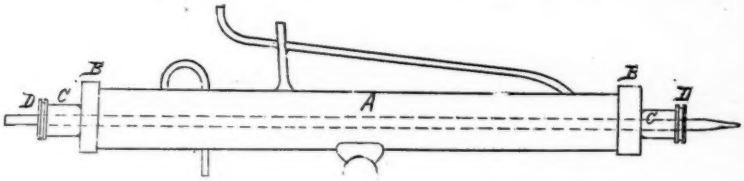
Wheatstone's Polar Clock.—A very ingenious application of the polarization of the well-defined regions of the blue sky has been made by Wheatstone in his so-called Polar Clock, by which the hour of the day may be ascertained by observing in the blue sky, in the direction of the celestial North Pole, the atmospheric polarization and its amount. The instrument consists of a tube placed parallel to the terrestrial axis, so as to give it a fixed direction in space not influenced by the earth's rotation. It is fitted at one end with a double image prism, as an eye piece, and has at the other end, directed to the North Pole, a small hole covered with a thin plate of selenite, of which, when looking through the prism, two images may be seen of opposite color. This double image prism is capable of rotation, and carries an index, which points the hour marked on a half circle. As the maximum plane of polarization is always seen 90° from the sun, the index will point to the right hour, when, by rotating the prism, the position is obtained showing no color in the two selenite images seen. Of course, the prism must be fixed once for all in the right position by trial, and when once properly placed, the solar time may be found without making use of the sun itself, and even when the sun is invisible, either behind a cloud or below the horizon, during the twilight morning or evening; then the hour may be found by the observation of the illumination of the atmosphere, because the shifting polarization moves with the sun and may be observed when only the blue sky at the North Pole is illuminated by the solar beams, while the sun itself may be still under the horizon, as is the case one or two hours before sunrise or as much after sunset.

Boric Acid in Constipation.—Dr. Platan, of Berlin, suggests the insufflation into the rectum of a pinch of boric acid, to relieve constipation. The results are said to be excellent even in severe cases in which mechanical measures have failed.—*Med. News*, Feb. 7, 1891.

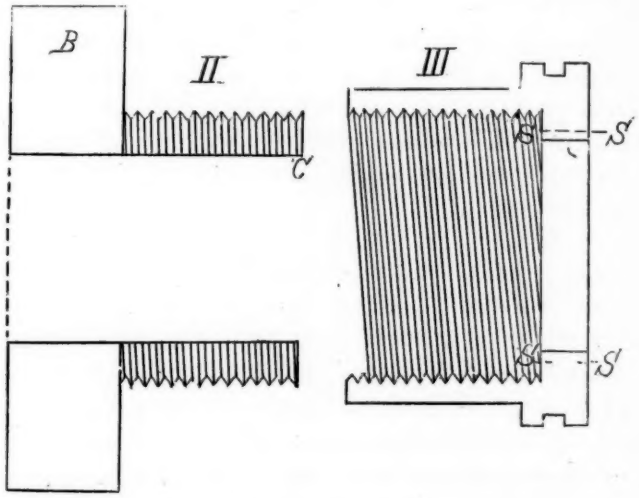
AN IMPROVEMENT IN LIEBIG'S CONDENSER.

By George M. Beringer, Ph.G.

Every one who has worked with the ordinary Liebig's condenser is familiar with the difficulty of making a water-tight connection between the glass tube and the cork and also between the outer metal tube and the cork. In the condenser shown the cork is replaced by a stuffing-box like arrangement at each end.



The condenser consists of the usual metal tube A with inlet and outlet tubes for the water supply. To each end of the tube is soldered a heavy metal reducing shoulder B to which is attached a short metal tube C, the diameter of which is slightly larger than the condensing tube of glass used. A screw thread is cut on the outside of this tube and the metal cap D is cut with corresponding thread.



It has a small shoulder or ledge at the head where the pressure is applied to the packing. Fig. III, S.

The glass tube being placed in position, a layer of packing is

wrapped around it at the places of exit through the small tube C attached to the shoulders. The ball lamp wick used for alcohol lamps I have found to make an excellent packing. The caps are now screwed down so as to impinge on the packing and tightly compress it in the shoulder of the cap and against the glass tube making a water-tight connection.

Figs. II and III are full-sized representations of the arrangement of the ends of the tube and of the cap.

BENZOIN AND PREPARATIONS OF BENZOIN.

ABSTRACTS FROM THESES.

Of seven commercial samples of benzoin examined by Luther G. Harpel, Ph.G., two specimens, Nos. 2 and 3, consisted of distinct tears of Siam benzoin not agglutinated by darker colored resin. No. 7 contained very few white tears, but a large proportion of fragments of bark and other vegetable matter. The remaining specimens were amygdaloid benzoin in which the amount of bark was smaller than in No. 7, but was not estimated, and in which the tears varied more or less in amount and size. The amount of benzoic acid was determined by Scheele's process with lime, and by the process of Bucholz with sodium carbonate, using alcohol for dissolving the benzoin as suggested by Stoltze. The test for cinnamic acid was made with potassium permanganate added to the acids after having been liberated from the lime solution, the odor of benzaldehyde being produced in the presence of cinnamic acid. The following table gives the results obtained.

Samples	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Scheele's process,	8·00	7·00	8·00	4·00	8·6	4·7	3·00 p.c.
Stoltze's "	8·25	7·50	7·75	4·00	9·00	5·00	3·00 p.c.
Bitter Almond Odor,	strong	none	none	decided	decided	strong	strong

Adeps benzoinatus of good quality is obtained by following one of the three methods described below, as suggested by John N. Prass, Ph.G. Concentrate upon a water-bath 1¾ fl. oz. of tincture of benzoin; to the residuary thick liquid add in small portions and incorporate well 16 oz. of lard; digest the mixture in a water-bath for about two hours until the alcohol has been driven off; strain through cotton flannel and cool. Or two parts of benzoin in No. 40 or 60 powder is incorporated with 100 parts of lard, the mixture

heated on a water-bath for about an hour and strained as before. A third method consists in thoroughly mixing 15 parts of lard with 1 part of *benzoinated oil*, which is prepared as follows:

Macerate benzoin in coarse powder, 1 oz., with ether 3 fl. oz., until dissolved, filter, add 3 fl. oz. of castor oil, shake well, remove the ether by evaporation or distillation, and add sufficient castor oil to make it measure 4 fl. oz.

Syrupus benzoini.—Rub tincture of benzoin 1 fl. oz., with magnesium carbonate 120 gr., and sugar 1 oz., then triturate with 8 fl. oz. of water, filter, add 12 troyounces of sugar, and dissolve with the aid of a gentle heat. When first made the syrup is of a somewhat lighter color than syrup of tolu; but upon straining it becomes of a golden yellow, slightly tinged with green. Its flavor is agreeable vanilla-like and preferable to that of tolu. It may be prepared extemporaneously from:

Soluble tincture of benzoin, which is obtained as follows: Mix 3 fl. oz. of alcohol with 8 oz. of glycerin; dissolve in this liquid upon a water-bath, 1½ oz. of benzoin; add 6 fl. oz. of water and set aside until cold; decant from the precipitated resin the milky liquid; triturate this with 120 gr. of magnesium carbonate, filter, and pass through the filter sufficient of a mixture of one volume of alcohol and two of water to make the whole filtrate measure 16 fluidounces. It forms a yellow or light brown liquid of an agreeable odor; and by mixing one measure of it with three measures of simple syrup, will yield a pleasantly flavored syrup which, however, is not equal in color or in balsamic properties, to the syrup prepared by the preceding formula.

Syrupus benzoini compositus has been prepared from the pharmacopœial compound tincture of benzoin by Harry H. Swainbank, Ph.G., and has been prescribed by several physicians who found it quite beneficial, particularly in combination with stronger expectorants, like ammonium chloride, etc., with which a very agreeable and efficacious cough syrup may be prepared. The syrup is best made from the tincture with the aid of magnesium carbonate, by mixing 30 gr. of the latter with 2 fl. drachms of the tincture, adding 2 fl. oz. of water, filtering, washing the filter with sufficient water to make the filtrate measure 2 fl. oz., and dissolving in this 3 troyounces of sugar. Thus prepared the syrup is clear, of a dark amber color, and has a pleasantly bitter and aromatic taste.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

The adulterations of powdered mace generally consist in the addition of Bombay mace or of other vegetable material (leguminous fruits) colored with turmeric. The presence of the latter is revealed by the finding of starch cells under the microscope, pure mace not containing starch. Bombay mace may be detected by boiling the suspected sample with alcohol and filtering through a white filter; in the case of pure mace the filter is stained a faint yellow, but in the presence of Bombay mace the filter, especially the edge, is colored red; if the quantity of the adulterant is very small the coloration shows only after drying the filter. Another and more delicate test is to add Goulard's extract to the alcoholic filtrate; with pure mace only a *white* turbidity is occasioned, but in the presence of Bombay mace a *red* turbidity or precipitate, dependent upon the quantity, is obtained. Turmeric will give a similar reaction, but the following test will decide upon the presence of turmeric or Bombay mace; a strip of filtering paper is saturated with the alcoholic solution, the excess of liquid removed by pressing between filtering paper and the strip drawn through a cold saturated solution of boric acid; if the adulterant was Bombay mace the paper remains unchanged while in the presence of turmeric the paper changes to orange or even brown. The addition now of a drop of potassium hydrate solution to the strip causes a blue colored ring, if turmeric is present, or a red ring in presence of Bombay mace.—Dr. Hefelmann, *Pharm. Ztg.*, 1891, 122.

Styracol, the cinnamic ether of guaiacol, is the successor of benzosol (Am. Journ. Pharm., 1890, 444) as a remedy for phthisis. It is claimed that styracol is readily decomposed, when taken internally, into cinnamic acid and guaiacol, the latter being the remedial agent. The new compound is made by mixing equal molecules of guaiacol and cinnamyl chloride, allowing to stand for two hours and then warming upon a water-bath; extracted with boiling alcohol, the styracol separates, on cooling, in long needles which, purified by recrystallization from alcohol, melt at 130° C. This substance is not likely to be more successful than benzosol because, as Sahli has proven, guaiacol acts directly upon the stomach; whereas benzosol is only decomposed into its components—guaiacol and benzoic acid—in the intestines.—Dr. A. Haas, *Südd. Apoth. Ztg.*, 1891, 55.

Phœnerythen is the name proposed for the red coloring principle formed in the liquefied portions of carbolic acid (AM. JOUR. PHARM., 1891, 133) in presence of minute traces of metal; by percolating red carbolic acid with benzin, the coloring matter can be removed, the purification being a mechanical one by displacement.—E. Fabini, *Pharm. Post*, 1891, 105.

Linden-oil, obtained from the seeds of Tilia parvifolia, *Ehrh.*, var. intermedia, *D. C.*, which contain about 58 per cent., has properties that should warrant its extraction on a large scale. In color and taste it is equal to the best olive oil; it is a non-drying oil and will not become rancid; exposed to low temperatures (— 21·5° C.) it does not congeal.—C. Müller, *Pharm. Ztg.*, 1891, 97.

Pyroxylin.—It may happen that in the making of this substance the nitrating of the cotton is excessive, yielding a product insoluble in the mixture of alcohol and ether; to remedy this Dr. Weiss advises macerating in water of ammonia for 24 hours, expressing and again macerating for 24 hours in water of ammonia; after washing and drying a pyroxylin is obtained yielding a very satisfactory collodion.—*Pharm. Ztg.*, 1891, 113.

Absorbent cotton.—An examination of a number of samples of absorbent cotton (treatment with ether in a Soxhlet's extraction apparatus) proved the presence of fatty acids and resinous matter, in all samples, varying from 0·5 to 1·15 per cent. Investigation disclosed that to meet popular favor the cotton, after having been freed from fat and resinous matter, was again passed through a soap solution and then through dilute acid; this precipitates upon the fibre a small quantity of fatty acids, which give to the cotton the pure white color and the peculiar feel. Extracting several samples of carefully prepared absorbent cotton with ether, a residue of resinous nature was obtained which in no case exceeded 0·16 per cent.; this represents constituents of the cotton insoluble in boiling dilute alkali or else is a product of the action of alkali upon cotton. The following is suggested as a requirement of absorbent cotton: 20 gms. extracted with ether should, after the evaporation of the ether, leave a residue, dried at 80° C., weighing not more than 0·03 gm.

In this investigation the materials used in bandaging (mull and cambric) were also included and these were found to give to ether

less than 0·15 per cent. resinous matter, indicating that these materials are not subjected to the soap and acid treatment.—Dr. A. Link, *Phar. Centralhalle*, 1891, 101.

Aseptic Eye-water—Franke recommends adding to 10 gm. of solutions of cocaine or atropine *two* drops of a one per cent. solution of mercuric chloride; this will keep these solutions aseptic for years. —(Wiener M. Bl.) *Phar. Centralhalle*, 1891, 109.

Soap-analysis—J. Pinette proposes the following simple method: 2 grams are dissolved in boiling neutral alcohol, any residue must be further examined. To the solution are added a few drops phenolphthalein and, in case an alkaline reaction is indicated, titrated with $\frac{n}{10}$ sulphuric acid; the neutralized solution is diluted with water to 100 cc., and transferred to a burette holding 230 cc., and graduated in 0·5 cc. to 200 cc., after cooling, 10 cc. normal sulphuric acid are added and the burette filled to the highest mark with a mixture of equal volumes of ether and petroleum-ether. The stopper is inserted, tied down, and the burette gently agitated until the fatty acids are dissolved; when the contents have completely separated, the volume of each layer is noted. To determine the fatty acids 25 cc. of the ethereal solution is removed with a pipette evaporated, dried and weighed. To determine the alkali in combination with fatty acids 25 cc. of the acid aqueous solution is removed and the excess of sulphuric acid determined by titration with $\frac{n}{10}$ sodium hydrate.—(*Chem. Ztg.*) (*Ztschr. f. Nahrungsm. Unters. u. H.*,) 1891, 27.

Cantharidin is Professor Liebreich's remedy for tuberculosis, administered by hypodermic injections. The solution used is made as follows: 0·2 gm. cantharidin and 0·4 gm. potassium hydrate (0·3 gm sodium hydrate) are warmed with 20 cc. water in a water-bath until solution is effected; this solution is diluted with warm water and after cooling made up to one litre. Cantharidin $C_{10}H_{12}O_4$ is the anhydride of cantharidic acid, $H_2C_{10}H_{12}O_5$, and in the above solution exists as cantharidate of potassium (or sodium) $C_{10}H_{12}K_2O_5$. The initial dose represents 0·1 mg. cantharidin which is gradually increased to 0·6 mg.; the remedy as yet has only been used in affections of the larynx and is easily tolerated by the system. Professor Fränkel, upon whose patients the experiments were made, emphasizes the statement that the bacilli become scarcer and thinner

under the treatment. Its action depends upon inducing a serous transudation in the diseased parts.—*Apotheker Ztg.*, 1891. 122.

Naphthalin-Camphor.—30·0 naphthalin and 10·0 camphor are melted by aid of a steam-bath and poured into suitable moulds or containers.

Perfumed Naphthalin-Camphor.—300·0 naphthalin and 100·0 camphor are melted and the following added: Coumarin 0·2, nerolin 0·2, nitrobenzol 1·0.

Soap plaster with salicylic acid.—850·0 white soap plaster and 50·0 filtered yellow wax are melted together, allowed to cool a little and 100·0 finely powdered salicylic acid incorporated; spread upon shirting.

Extract of malt with cod-liver oil.—50·0 moderately warmed malt extract are triturated with 50·0 cod-liver oil added in small portions so as to insure thorough admixture; if the preparation becomes too thick add a small quantity of water.

Glycerin-gelatin, a basis for suppositories, bougies, etc., may be made either hard or soft. *Hard:* 25·0 gelatin are covered with 70·0 distilled water, allowed to stand a few hours, 50·0 glycerin added and warmed in a steam bath until the mass weighs 100·0. *Soft:* 15·0 gelatin, 45·0 distilled water and 50·0 glycerin are proceeded with as before.

Kola-liquor.—250·0 roasted kola-nuts, in moderately fine powder, 2·0 powdered cochineal, 100·0 arac and 3330·0 corn-spirit (90 per cent.) are macerated for 8 days, filtered and a boiling hot solution of 4500·0 sugar in 3500·0 water added. Flavor with 3 drops oil of bitter almonds. This liquor is very sweet; for a more palatable preparation the sugar quantity may be reduced to 3000·0.

Ferrated Cod-liver oil.—1·0 medicinal soap is dissolved in 60·0 warm distilled water and 17·0 solution of oxychloride of iron diluted with 30·0 distilled water added; the precipitate is washed first by decantation, later on a filter, until the washings cease to react with silver nitrate. The precipitate, dried as much as possible by pressing between filter paper, is triturated with 100·0 cod-liver oil and warmed on a water-bath until dissolved; filter after cooling. The preparation is a clear, dark-brown oil which contains about 0·5 per cent. metallic iron.

Lavender salts.—A wide-mouth, ground-stoppered bottle is filled with cubes of clear ammonium carbonate; the interstices are filled with the following solution: 10·0 lavender oil, 5·0 spirit of ammonia and 85·0 alcohol.—E. Dieterich, *Pharm. Centralhalle*, 1891, 134.

Gentisin.—This yellow crystalline substance from gentian by boiling with hydriodic acid is demethylated forming *gentisein* $C_{13}H_8O_5$ which crystallizes with $2H_2O$ in fine straw-yellow needles; these become anhydrous at 100° C. By boiling gentisein with acetic anhydride and anhydrous sodium acetate a triacetyl derivative is formed, crystallizing in large, lustrous, white needles easily soluble in glacial acetic acid, difficultly soluble in alcohol. From these results gentisin $C_{14}H_{10}O_5$ is the methyl ether of gentisein $C_{13}H_5O_2(OH)_3$, and the formula can be written $C_{13}H_5O_2(OCH_3)(OH)_2$.—Von Kostanecki, *Schwz. Wochensch. f. Pharm.*, 1891, 59.

Estimation of arsenic in acids.—M. Kretzschmar recommends, in case of hydrochloric acid, to add sodium carbonate to 20 gm. acid largely diluted with water until a faint acid reaction remains. Then render alkaline with ammonia, add some yellow ammonium sulphide, supersaturate with C. P. hydrochloric acid and precipitate As_2S_3 by H_2S, warming the solution; this precipitation, which in other methods requires 15–24 hours, is complete in 2 hours. The As_2S_3 is thoroughly washed, dissolved by use of KOH and bromine water, made slightly acid with HCl and then H_3AsO_4 precipitated by addition of ammonia and magnesia mixture; weigh as $Mg_2As_2O_7$.

In the case of sulphuric acid, S. Prauss dilutes 10 cc. with water and generates hydrogen by addition of pure zinc. The evolved gases are passed for 2 hours through standardized nitrate of silver solution; at the end of this time the undecomposed silver nitrate is estimated volumetrically by sulphocyanate of ammonium. 12 molecules silver nitrate are decomposed by one molecule As_2O_3. The results agree closely with those obtained by gravimetric methods.—*Chemiker Ztg.*, 1891, 299 and 300.

Depilatory powder.—A harmless remedy is made containing strontium sulphide; this has the advantages over the sulphides of arsenic, calcium and barium, in not being poisonous, in being permanent and that in its application H_2S is not evolved. It is patented in Germany under the name "Antikrinin."—*Chemiker Ztg.*, 1891, 227.

Iodopyrine (*iod-antipyrine*) and *iod-acetanilide*.—These two iodine derivatives, made by the Chemische Fabrik in Hoechst a. M., have been examined physiologically by E. Munz, who finds the last mentioned entirely inert, possibly on account of its insolubility. The first retains the action of antipyrine and possesses additionally the therapeutic action of iodine as an alkaline iodide; taken internally it is decomposed in the stomach into iodine and antipyrine. Iodopyrine forms colorless, lustrous, prismatic needles; melting at 160° C. It is tasteless and odorless and difficultly soluble in water and alcohol.—(*Prager Med. Wochenschr.*) *Oesterr. Ztschr. f. Pharm.*, 1891, 110.

Lycopersicum esculentum.—The tomato fruit has been chemically examined by G. Briosi and T. Gigli. On an average the fresh fruit contains: Seeds 10·9 per cent., pulp 85·4 per cent. and skin 3·7 per cent. The pulp can be separated into a yellow juice and a red residue, which is tasteless after washing; the juice on an average has the specific gravity 1·0217 and contains levulose, citric acid (0·4 to 0·65 per cent. of the juice), albuminoids and ash which is composed of 60 per cent. potassium salts. Minute traces of alkaloid are indicated; tartaric acid could not be detected. The red residue will impart its coloring matter to ether, alcohol, chloroform and aqueous alkalies. The alcoholic solution is not changed by ferric chloride, dilute acids or alkalies; on addition of strong nitric acid a transient blue color is produced; the residue on evaporating the alcoholic solution becomes blue by adding sulphuric acid; the coloring matter resembles that of saffron.—*Chemiker Ztg.*, 1891, 205.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

SOLUTIONS OF ACTIVE MEDICAMENTS.—At the Feb. 4th meeting of the *Société de Pharmacie de Paris*, M. Petit proposed that medicaments like aconitine, digitalin, strophanthin, etc., be prepared in 1 to 1000 solutions. Alcohol being necessary to the conservation of such preparations, and being, at the same time, lighter than water, M. Petit proposes to bring the liquid to the proper density by the addition of glycerin. The proportions to use for making a glycerized alcohol having the same density as water are given as follows: Glycerin (D=1·250 at 15°), 333 ccm.; distilled water, 147 ccm.;

alcohol at 95°, 520 ccm. This liquor gives the same results, measured or weighed. One gram, or 1 ccm. of it, corresponds to 50 drops, thus permitting of the administration of one-fiftieth of a milligramme of active principle.

RESOPYRIN.—M. Portes described at the Feb. 4th meeting of the *Soc. de Phar. de Paris*, a new composite made by Dr. Roux from antipyrin and resorcin. He made 1 to 3 solutions of these substances and mixed them in like proportions with their equivalents. The resultant crystals appeared in the form of oblique prisms with rhombic bases. They were colorless, soluble in 100 parts of alcohol and in ether and chloroform. They were nearly insoluble in water, and were odorless and almost tasteless, saving a slightly sharp impression upon the tongue.

PREPARATION OF HYPNAL, OR MONOCHLORAL-ANTIPYRIN.—In an article in the *Bull. de la Société des Pharm.*, No. 9, 1891, M. Demandre writes that pharmacists may easily prepare this compound for their own use. He gives the following method: Make a solution of 47 gm. of chloral in 50 gm. distilled water; make a solution of 53 gm. of antipyrin in the same quantity of distilled water; mix these solutions and place the liquor in a funnel provided with a stop-cock. An oily liquid falls from the aqueous mass; this portion is drawn into one capsule and the water into another. In about 24 hours the oily liquid is found to have become almost wholly transformed into a mass of transparent rhombic crystals. A few smaller crystals have formed in the centre of the aqueous liquor. The mother liquors are now drained off from both crystalline formations and the crystals mixed together. The latter are then dried between sheets of filtering paper, or under a bell-glass in the presence of sulphuric acid.

OIL OF STROPHANTHUS.—The seeds of Strophanthus hispidus give 24 per cent. of a greenish yellow or greenish brown oil, having a density of 0·9247 at 21° (according to Fischer), and 0·925 at 15° (according to Helbig). It has a faint "narcotic odor." It easily saponifies with potash. It contains 92 per cent. of fat acids, which melt at 44° and solidify at 38°. The co-efficient of saponification is 179 5 With concentrated sulphuric acid it gives a brownish green viscous mass. With nitric acid it becomes emerald green. With fuming nitric acid it gives a green coloration, passing to reddish

brown, changing again to greenish yellow.—*Ann. di. Ch. e di Farm.*; *Répert. de Phar.*, March 10.

PREPARATION OF TINCTURE OF IODINE.—M. Benoit writes as follows in the *Arch. de Phar.*, March 10: We know that paintings with long-prepared tinctures of iodine are often painful from the start; but tinctures made by the cold process in the proportions given by the Codex have no immediate action when applied to the skin, so that, in acute bronchitis, for example, the derivative influence of the preparation takes place too late. Hence, I believe that, instead of trying to avoid the production of hydriodic acid in the making of this preparation, it is preferable to induce it. For this, we must renounce the cold processes, and dissolve the iodine in a water-bath, taking care not to apply the heat longer than will be necessary for effecting a complete solution. As to the use of iodide of potassium to facilitate the dissolving of the iodine, it should be rejected as constituting a regrettable modification of the formula of the Codex.

EXTEMPORANEOUS PREPARATION OF KINO.—Kino, 6; water, 9; glycerin 9; alcohol, 36. *Boll. Farm.*; *Répert. de Phar.*, March 10.

SULPHORICINIC ACID AND SULPHORICINATES.—Sulphoricinate of soda (the excipient below named) is made by making sulphoricinic acid exactly neutral with soda. It adheres well to the skin and is said to give good results in ulcerative laryngeal tuberculosis, ozena and diphtheria. SULPHORICINATED PHENOL is made by dissolving with a little heat 40 gm. of pure phenic acid with 100 gm. of sulphoricinate of soda. Weaker solutions may be made. It is applied as a paint in diphtheria. SULPHORICINATED NAPHTHOL: Sulphoricinate of soda, 100 gm.; naphthol β, 10 gm.; dissolve; two tablespoonfuls are added to a litre of water. The resultant emulsion is used as a wash in ozena. SULPHORICINATED CREOSOTE: Sulphoricinate of soda, 100 gm.; creosote, 15 gm.; this may be used pure or an emulsion may be made with water, for a wash in laryngeal tuberculosis. SULPHORICINATED SALOL: Sulphoricinate of soda, 100 gm.; salol, 15 gm.; may be used pure or mixed with water (2 tablespoonfuls per litre) as a wash for ulcers.—P. Yvon in *Le Progrès méd.*, Dec. 13, 1890.

OINTMENTS CONTAINING LARGE PROPORTIONS OF EXTRACTS OR SALTS.—In the *Jour. de Phar. d'Anvers*, Feb., M. Vindevogel rec-

ommends that 2 gm. of pulverized gum tragacanth be added for each gram of the water employed in dissolving the salt of extract. After trituration, the fatty body is added. A homogeneous ointment of good consistence and adhering to the sides of the mortar, may thus be easily made. The gum may even be added after the mixture of the fatty substance with the extracts. Concerning the above, the editor of the paper cited says that the incorporation of the gum might be an obstacle to the absorption of the medicaments by the skin, on account of the amount of bassorin present in tragacanth.—*Répert. de Phar.*, March 10.

ON THE VERATRUM ALKALOIDS.[1]

By Dr. S. C. Pehkschen.

In an essay presented to the medical faculty of the University of Dorpat, the author reports the results obtained from his researches on the alkaloids of cultivated and uncultivated Veratrum album and also of commercial specimens of V. album and V. viride. The yield of crude alkaloid varied very much; from the uncultivated rhizome of V. album (obtained from Thuringia) 0·57 per cent. was obtained, from commercial V. album 0·66 per cent., and from the cultivated rhizome (from Bamberg, Bavaria) 0·29 per cent. or only about one-half the amount present in the uncultivated rhizome. Of the alkaloids present, it may be said that the cultivated rhizomes contain relatively more veratroidine and the rhombic crystals (pseudojervine?), while the uncultivated contain a larger proportion of jervine. Veratrum viride yielded only about 0·08 per cent. crude alkaloid, which by qualitative tests was found to be composed principally of jervine with very little veratroidine, while the rhombic crystals (pseudojervine?) were absent.

The method finally adopted for extracting the alkaloids was as follows: 4 kilos of the powdered rhizome were macerated for six days with 16 kilos of 85 per cent. (volume) alcohol, expressed and filtered (the filtrate had an acid reaction due probably to jervic acid); the residue was treated a second time as above with alcohol, and to insure thorough extraction a third time, but now with the addition of 100 cc. 99 per cent. acetic acid to the alcohol. From

[1] Translated and abridged by F. X. Moerk, from *Pharm. Zeitsch. f. Russland*, 1890, pp. 339, 353, 369, 385, 401, 417 and 433.

the united filtrates most of the alcohol was recovered by distillation under reduced pressure, to the remaining thin extract were added 3–4 volumes hot distilled water, the resin separated by filtration and the coloring matter removed from the filtrate by agitating with 4 or 5 portions of ether. The aqueous liquid was next made alkaline with sodium bicarbonate, extracted with 4 or 5 portions of ether, and afterward with chloroform, until Mayer's reagent failed to produce a turbidity with an aqueous solution of the chloroform residue. Under the microscope the ethereal residue was seen to consist of tufts of crystalline needles, through which were scattered some rhombic crystals; the chloroform residue was amorphous and of a dark yellow color. Both of the residues were colored yellow, orange and, finally, brown-red with concentrated sulphuric acid. The crude alkaloids obtained from the different specimens of V. album were mixed and dissolved in 10 per cent. acetic acid, agitated with ether to remove coloring matter, etc., following the process outlined above in the extraction; after repeating this purification, the alkaloids were separated by first treating with absolute ether, which removed the veratroidine with a little jervine; the insoluble portion, dissolved in absolute alcohol, was set aside to crystallize; there appeared, first, individual rhombic crystals which were removed, and later, small needle-shaped crystals arranged like glands (jervine); by the addition of HCl to acid reaction, and setting aside a further quantity of hydrochlorate of jervine was obtained. The mother-liquor from this formed, on evaporation, a brown amorphous mass, of which a portion was soluble in benzol; this solution, by addition of petroleum ether, yielded a colorless flocculent precipitate found to consist of a mixture of veratroidine and jervine. The portion insoluble in benzol was treated with 10 per cent. acetic acid, filtered, the filtrate made alkaline with sodium carbonate and extracted with chloroform; the latter solvent upon evaporation left a yellow amorphous mass. The reactions of this, possibly, a fourth alkaloid (Wright and Luff's veratralbine) are: with concentrated H_2SO_4 yellowish-green; with Froehde's reagent yellowish brown; with concentrated HNO_3 reddish-yellow; evaporated to dryness on a water-bath with fuming HNO_3 and addition of alcoholic KOH, a dark yellow coloration; melting point 281 °C.; the addition of a small quantity of veratroidine causes at once the color reactions of Wright and Luff's

veratralbine. The yield, however, was so small as to prevent further investigation at the time.

The ether-soluble alkaloid (mixture of veratroidine and jervine) was dissolved in absolute alcohol, acidified with a slight excess of HCl and the jervine hydrochlorate allowed to crystallize out; the mother-liquor was diluted with water, agitated with ether, until the ether was free from color, the aqueous solution rendered alkaline with sodium bicarbonate and again agitated with ether until all of the alkaloid was removed. The residue from this ethereal solution (veratroidine) was a pale yellow amorphous mass, yielding a colorless powder, the yield was 0·06 per cent. of the rhizome taken.

Veratroidine (dried at 58° C.; at higher temperatures, 75–78°, it already becomes dark colored) has the formula $C_{32}H_{53}NO_9$ (determined by ultimate analysis, analysis of its gold and platinum salts, by a determination of the molecular weight by Raoult van't Hoff's method, and by neutralization with HCl and H_2SO_4). It is soluble in absolute alcohol in almost any proportion, easily soluble in acetic ether, amyl alcohol and carbon disulphide, in 10·5 parts 80 per cent. alcohol, 9·1 parts absolute ether, 5·9 parts chloroform, 13 parts benzol and 790·2 parts petroleum ether; from none of these solvents could it be obtained crystallized. It melts at 149·2° C., and is optically inactive. The sulphate has the formula $(C_{32}H_{53}NO_9)_2 H_2SO_4$ and the hydrochlorate $C_{32}H_{53}NO_9HCl$; none of its salts could be obtained in crystals. Color reactions with concentrated acids: H_2SO_4 first yellow, passing through orange to cherry-red, the solution having a green fluorescence; HNO_3 momentarily a red color, afterwards lemon yellow; HCl pale red, on moderate warming decolorization, but upon boiling for a few minutes, a permanent cherry-red (one year's standing did not change the color). Froehde's reagent yellow, afterwards dirty brown. Vanado-sulphuric acid yellow, violet, finally, cherry red. Seleno-sulphuric acid, red. Dilute HCl produces a beautiful red color, best results attainable with an 11 per cent. acid. Differences between veratrine and veratroidine: (1) With concentrated H_2SO_4 veratrine produces a yellow color, changing on addition of bromine water to a beautiful purple; with veratroidine, a brownish yellow color; (2) Veratrine evaporated upon a water-bath with fuming nitric acid leaves a yellow residue changing to violet or red on addition of alcoholic KOH; veratroidine forms a dark yellow solution; (3) The veratrine reaction:

concentrated H_2SO_4 and sugar causing the play of colors yellow, dark green, blue and finally violet is not obtained with veratroidine. Both of these bodies evaporated with zinc chloride solution (1 : 30) give a red color. Veratroidine in its reactions and solubilities closely resembles veratralbine and cevadine.

Alkaloid obtained in rhombic crystals (Pseudojervine ?)—Purified by recrystallization from strong alcohol, the yield was only 0.006 per cent.; dried at 110° C., it was found to agree to the formula $C_{29}H_{49}NO_{12}$ (by same determinations as under veratroidine). Dried at 100°C., it is soluble in 4.1 parts chloroform, in 101 parts 80 per cent. alcohol, in 184 parts absolute alcohol, in 372 parts benzol, in 1,021 parts absolute ether and in 10,876 parts petroleum ether; by evaporating these solutions rhombic crystals were obtained, excepting the chloroform solution which gave concentrically arranged needles. It melts at 259.1° C. and is optically inactive. No color reactions could be obtained with this base, but if the minutest quantity of veratroidine or jervine is added, color reactions agreeing with Wright and Luff's pseudojervine are gotten. The hydrochlorate $C_{29}H_{49}NO_{12}HCl$ and the sulphate $(C_{29}H_{49}NO_{12})_2\ H_2SO_4$ are easily soluble in water, alcohol and ether, differing from the base itself.

Jervine.—Purified by recrystallization from absolute alcohol it forms snow-white crystalline needles; dried at 100° C. it has the formula $C_{14}H_{22}NO_2$ (determined by ultimate analysis, and by the determination of chlorine in the hydrochlorate, and of sulphuric acid in the sulphate.) Pure jervine dried at 100° C. is soluble in 16.8 parts absolute alcohol, in 60.5 parts chloroform, in 180 parts 80 per cent. alcohol, in 268.4 parts absolute ether, in 1658.7 parts benzol, difficultly soluble in water, acetic ether and carbon disulphide, and insoluble in petroleum ether; from all of its solutions it is obtained in well-formed needles. Jervine melts at 237.7° C. and is slightly lævogyre. Color reactions: It differs from veratroidine especially in the first two tests; concentrated HCl dissolves it without color, gradually becomes red and upon boiling dirty yellow; concentrated H_2SO_4 and sugar give a pretty violet, changing to blue, the depth of color depends upon the quantity of jervine taken (this test resembles that for veratrine); evaporated with fuming HNO_3 on a water-bath and adding to the residue alcoholic KOH a dark yellow color is obtained (veratrine gives violet

changing to red); concentrated HNO_3 dissolves colorless, becoming red and, after a short time, yellow; Froehde's reagent yellowish-green; concentrated H_2SO_4 yellow, yellowish-green, and after some time dark green without fluorescence. Jervine forms a neutral hydrochlorate $C_{14}H_{22}NO_2.HCl2H_2O$, and an acid sulphate $C_{14}H_{22}NO_2.H_2SO_4H_2O$.

Veratroidine and the rhombic crystals possess sternutatory properties, while jervine does not. Physiological experiments made by Prof. Kobert upon dogs or cats and frogs established the lethal dose (by subcutaneous injection) for 1 kilo weight of these animals. Veratroidine: dogs or cats, 0·9 mg.; frogs, 9 mg. Rhombic crystals: dogs or cats, 1·2 mg.; frogs, 3 mg. Jervine: 4 mg. for dogs and cats while 80 mg. for frogs were without any apparent action. 0·03 mg. veratroidine per kilo injected directly into the blood vessel of a dog produced marked reduction of the pulse rate.

THE MEDICINAL USES OF FLOWERS.

By P. L. Simmonds, F.L.S.

Among the various parts of plants which are used in medicine, flowers play no insignificant part in different countries. Besides those which are recognized in pharmacy, a great number are popularly employed. It may not be uninteresting to enumerate some of these and to give a few details concerning them. Flowers have their uses also as food substances, as important sources of perfumery, and as dyes, but it is for their alleged medicinal properties that we would regard them here.

The strobiles of the female flowers of the *hop* are valuable for their aromatic, tonic and mild narcotic properties.

The *Damask roses* are grown for medicinal purposes. Before the bud is about to open, the bottom, or "heel" as it is termed, is cut off, and the top dried and preserved, to make either infusion or conserve of roses. The Provence rose (*R. gallica*) is said to be astringent. The flower of the hollyhock (*Althæa rosea*) is mucilaginous and demulcent and officinal in Greece. Those of the marsh mallow (*Althæa officinalis*) are much used in France under the name of "Guimauve." The red flowers of *Grislea tomentosa* are considered an astringent tonic.

The dried stigmas of the *Crocus* are also of importance. Saffron has been highly prized from a remote period as a condiment, perfume and dye. It is largely produced in France, and other parts of Europe, and is also grown in some parts of Asia, China, Japan and Tunis. The stigmas are the only useful product of the flower, the rest being waste, and of these it takes some 70,000 to produce a pound of saffron. It is used for coloring and flavoring food, and even for dyeing morocco leather, but the price is too high to admit of its extensive use as a dye. About 280 cwt., valued at £58,000, are imported into India. Cake saffron is made of the florets pressed together with mucilage.

As a medicine, in small doses, saffron is considered stomachic, and is prescribed in fevers; in large doses, it stimulates the nervous system.

A species of saffron is obtained from the Cape Colony, the produce of *Lyperia crocea*.

The cusso (*Hagenia abyssinica*) furnishes a well known anthelmintic, and the flower heads of species of *Artemisia* act as a vermifuge.

An infusion of lime or linden flowers (*Tilia europæa*), drank as tea, is reputed to be a cure in chronic epilepsy. They are used in France in the form of a tisane, and the distilled water is considered an antispasmodic.

The flowers of *Malva sylvestris*, and of other species, are emollient, and an infusion of the petals is given as a demulcent.

Narcissus is vomitive, and a decoction of broom flowers (*Genista scoparia*) is diuretic.

Violets are considered purgative, but a conserve of the flowers with sugar has a grateful flavor for covering nauseous medicines.

The whole plant of *Viola odorata* is sold in a dry state in all the bazars of Bengal, and is given in infusion as a diaphoretic in fevers. In large doses it nauseates and often produces vomiting. The Romans had a wine of violet flowers, and it is said they are still used in the preparation of sherbets. The flowers of some species are diaphoretic and laxative.

The Turks prepare a cooling drink from the flowers of *Nuphar luteum*.

The flowers of *Anthemis nobilis* form a useful stomachic, antispasmodic and tonic in dyspepsia and general debility.

The balausta flowers of the pomegranate are rich in tannin and gallic acid, and can be used as an astringent.

The flowers of *Urena lobata*, of Brazil, are used as an expectorant in dry and inveterate coughs.

The shoe flower (*Hibiscus Rosa-sinensis*) is used as a tonic in China, and as a dye for silk.

The dried blossoms of the Chulan plant (*Chloranthus inconspicuus*) are classed amongst medicines in China, but they are rather used to scent the tea of commerce than for pharmaceutical purposes.

The dried flowers of *Hemerocallis graminea* and of *Lilium bulbiferum* are of considerable repute as a medicine in pulmonary affections and tonic of the kidneys; also largely employed in cooking, as a tonic or relish with meat dishes. They are usually twisted into lengths of 4 or 5 inches; the color is of a dark brownish-yellow, covered by a whitish bloom.

The dried red flowers of *Carthamus tinctorius* in China are a stimulant sedative, and also used to cause abortion. They are a component in the manufacture of rouge.

The dried flowers of a honeysuckle, which resemble tobacco in odor, are used in China in cases of rheumatism.

The buds of *Cassia Sophora* are considered to be a tonic and astringent.

The flowers of *Chrysanthemum album* and *C. flavum* are taken for flatulency.

There are many other flowers used medicinally in China, but as only their native names are given, it is impossible to identify them.

The flowers of *Paronychia argentea* are used in Morocco as a diaphoretic nd for abdominal pain.

The flowers of *Calotropis gigantea* are considered digestive, stomachic, tonic and useful in catarrh, asthma and loss of appetite.

The sweetly scented flowers and other parts of *Ipomœa bona-nox* are among the medicines supposed to have some merit as remedies against snake-bites.

A poultice of the flowers of *Melia Azedarach* is applied to relieve nervous headaches, and has the reputation of being useful to kill lice and to cure eruptions of the scalp.

The flowers of *Ocimum Basilicum* possess stimulant, diuretic and demulcent properties.

The flowers of *Quassia amara* are infused in wine or water as a stomachic, every part of the tree being bitter.

From the flowers of *Thibaudia Quereme* an aromatic tincture is prepared in Peru as a remedy for toothache.

In Goa, Portuguese India, the flowers of *Eleusine coracana* are prepared and much esteemed in chest complaints and debility. Many natives live upon them alone prepared in some way.

In India with the flowers of *Erythrina indica*, the juice of which is unctuous and aromatic, they prepare a syrup much employed in affections of the chest.

With the flowers of *Cassia fistula*, a purgative syrup, known as gut-kand, is made, which is considered a febrifuge.

The flowers of *Vitex trifolia* are prescribed with honey in cases of fevers, accompanied with vomiting and severe thirst.

The Nagassar flowers (*Mesua ferrea*) are obtained in the bazars of India, in a dried state, being used in medicine as a stimulant, astringent and stomachic, as well as esteemed for their fragrance. The grandees of Ava are said to stuff their pillows with the dried anthers of the flowers on account of their fragrance. The flowers and leaves are regarded, in Bengal, as antidotes to snake-bites. Dried in powder the flowers, with butter and sugar, are used as an astringent in hemorrhoidal discharges. The flowers when distilled yield an attar.

The flowers of *Michelia Champaca* are of a yellow, sometimes deep orange color, and exquisitely fragrant. They are highly esteemed by the Hindoos, especially for the use they make of them in their religious ceremonies.

Flowers, as we have thus seen, are much used in medicine, but they are also employed, in some instances, as an article of food. It is rarely that we find the corolla of a plant serving any other purpose than as a temporary protection for the reproductive organs within. But for a flower to secrete more than half its weight of sugar, and thus become an article of economic value, and even of commerce, is most remarkable; of this we have an instance in the flowers of an Indian tree, species of *Bassia*.

Some flowers attract birds and bees by their nectar, others repulse them by their stupefying odor. The Persian insect powder of commerce consists of the florets of the disk of different species of *Pyrethrum*, collected before the seed is fully formed. The flowers of *Tansy* are also said to have a stupefying effect on insects. The caucasian and Persian flowers, usually called Guirila, although first employed, are no longer now of commercial importance. The cultivation is chiefly carried on in Dalmatia and Montenegro. The trade centres in Trieste, where about 12,000 cwt. are sold yearly, at the price of about £11 a cwt. The unground flowers are much preferred, as the powder is greatly adulterated. From one Russian port, Poti, this insect powder used to be exported to the value of £7,000 a year.

GINSENG.

Aralia (Panax) quinquefolia.

The following references to articles upon this medicinal plant may be useful to readers of your journal:

Belknap's History of New Hampshire (1792), Vol. III, p. 121.

William's History of Vermont (1809), Vol. I, p. 85.

Bird's History of the Dividing Line between Virginia and South Carolina (original MS. 1729–1733), new edition, 1866. Vol. I, p. 161; Vol. II, pp. 13, 16, 67.

Mauray and Fontaine's Resources of West Virginia (1876), p. 139.

Kalm's Travels, Vol. III, p. 114.

Michaux's Travels, pp. 207–11.

Talbot's Travels, p. 314.

Fortune's "Yeddo and Peking," p. 281.

Hough's U. S. Forestry Reports: Vol. I (1877), p. 385; Vol. II (1878–9), p. 374.

Mason's Year-Book of Facts (London 1877), p. 34.

Transactions American Institute, 1870–1, p. 612.

Paxton's Magazine of Botany 1837, p. 169.

Gardeners' Chronicle, 1856, p. 196; 1891, p. 50.

Horticulturist, 1847, p. 101.

Gardeners' Monthly, 1881, p. 214.

Country Gentleman, 1877, pp. 88, 295; 1878, p. 308.

American Agriculturist, 1881, p. 378; 1886, p. 255; 1890, p. 645.

New York Independent, 1891, p. 34.

Scientific American, 1891, pp. 19, 69.

Scientific Farmer, 1878, p. 148.

A. A. CROZIER.

Washington, D. C., March 16, 1891.

MINUTES OF THE COLLEGE MEETING.

PHILADELPHIA, March 30, 1891.

A stated meeting of members of the College was held, this day, in the Hall, Chas. Bullock, presiding. This being the annual meeting, reports of officers and standing committees were received. The Editor submitted his annual report, which was on motion accepted; the following is an abstract of the report:

During the year just terminated 85 original papers were contributed. This number has been exceeded four times only during twenty years. Nine members of the College contributed 32 papers. Seventeen authors, not members, furnished 37 papers. Abstracts from 30 theses, from foreign journals prepared especially for this Journal, together with reviews and notices prepared by the Editor, and selected essays, constituted the balance of the literary matter. Thirty of these papers were read at the Pharmaceutical meetings. An increase in attendance, and interest in these meetings is very apparent, stimulated doubtless by the efforts of the committee who have taken the subject in hand. Whilst the College bestows a number of prizes for original work and investigation, which yield good result, the Editor is of opinion that members of the College and employers might arouse effort in their assistants, and students by

aiding and encouraging a desire to perform such work. The Editor expresses his many obligations to contributors and correspondents.

The Chairman of the Publication Committee referred to the regularity in issuing the Journal, and to the Reports of the Business Editor and of the Editor, which supplement his statements.

The Report of the Librarian states that, besides the journals received as exchanges, about 75 volumes have been added to the library since the last statement, and calls attention to the fact that space and shelf room are insufficient, and also notes that the use of the library is growing more extended with each recurring year.

The Report of the Curator, after referring to the satisfactory condition of the museum, acknowledges the contributions from Messrs. Rosengarten & Sons, and Messrs. Powers & Weightman of some very interesting specimens of chemicals.

The Board of Trustees, through a committee of that body, appointed to consider an amendment to the By-law on Life Membership recommend to the College the following:

Chapter viii after Article 4th.

"Any member not in arrears for annual dues, who shall pay to the Treasurer of the College in one payment, such a sum as will amount to $50 after allowing a credit of $2 for each annual contribution heretofore paid shall, become a life member, and shall be exempt from all further dues."

On motion, the report was accepted, and action thereon necessarily deferred until the next meeting of the College.

The President presented a certificate of award, and a medal of honor bestowed upon this College for the exhibit made by the Philadelphia College at the French Exposition of 1889.

Prof. Maisch announced the death, on March 23, of Chas. C. Spannagel, an apothecary of this city, and a member of this College.

Mr. Krewson informed the members of the death of Edward Gaillard, also an apothecary of Philadelphia, and member of this College, which event occurred this day, March 30, 1891.

On motion, the Committee on Deceased Members were requested to take cognizance of these events.

Prof. Maisch referred to the fact of the Maryland College of Pharmacy being about to reach its semi-centennial or fiftieth anniversary, April 17, next, and of the accord and good relation always existing between that Institution and this College, and offered the following resolution, which was on motion duly accepted: "That a Committee of three be appointed by the President to convey in suitable words of congratulation to the faculty and members of the Maryland College, the sentiment of this College on this occasion."

The President appointed Prof. Maisch, Prof. Remington, and Mr. Alonzo Robbins, to constitute the Committee.

Prof. Maisch referred also to a similar anniversary (the 50th) of the Pharmaceutical Society of Great Britain, occurring May 27, next, and offered the following preamble and resolution, which was on motion adopted:

WHEREAS, The Pharmaceutical Society of Great Britain will celebrate, on May 27, next, the fiftieth anniversary of its organization; therefore, be it

Resolved, That the Philadelphia College of Pharmacy offers its hearty

congratulations on the completion of the fiftieth year of existence of the Pharmaceutical Society of Great Britain.

Resolved, That the officers of this College transmit these congratulations to the Pharmaceutical Society of Great Britain, coupled with our wishes for the continued usefulness of the Pharmaceutical Society in its endeavors to render excellent service to mankind by earnest labors for the elevation of Pharmacy.

It was, on motion, resolved that an engrossed copy of the above, properly attested, be sent to the foreign society from this College.

An election for Officers and Trustees of the College, and of Standing Committee for the year ensuing being ordered, resulted as follows:

President—Chas. Bullock.

Vice-Presidents—Robt. Shoemaker, William J. Jenks.

Treasurer—William B. Webb.

Corresponding Secretary—Dr. A. W. Miller.

Recording Secretary—William B. Thompson.

Librarian—Thos. S. Wiegand.

Curator—Jas. W. England.

Publication Committee—Henry N. Rittenhouse, James T. Shinn, Charles Bullock, Thos. S. Wiegand, John M. Maisch.

Editor—John M. Maisch.

Trustees for 3 years—Gustavus Pile, Wallace Procter, W. Nelson Stem.

On motion, meeting adjourned.

WILLIAM B. THOMPSON, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

MARCH 17, 1891.

On motion of Mr. Webb, Mr. Wm. McIntyre was called to the Chair.

The minutes of the last meeting were read, and it was stated that in the formula for *red bottle liniment*, the quantities given on page 154 for oil of origanum, oil of caraway and alcohol, should read *fluid ounces* in place of fluid drachms.

The calendar of the British Pharmaceutical Conference, the Consular Reports to the Department of State, and the Toner lectures of the Smithsonian miscellaneous collections, were received for the library, and the thanks of the College for the same were returned.

A paper on *Alum root*, by Mr. J. C. Peacock, of the present Senior Class, was read and referred.

Prof. Trimble said that Heuchera americana, growing at our own doors, yielded a drug almost as rich in astringent matter as any imported, and could be gathered here at the time when the astringent matter is in greatest proportion; this was a very important consideration as had been shown by the paper published two years ago relative to geranium.

Mr. England read a paper upon *Koch's lymph*, which has been attracting so much attention in the public mind in its remedial powers over consumption. In reply to a question as to its efficacy, it was stated that there had not been time enough to determine its curative merits, but as a means of diagnosis it was undoubtedly of great value. Inquiry was made about *Dr. Roussel's remedy*, which was stated to be generally considered as being sterilized olive oil and eucalyptol. Attention was also drawn to the distinction in their actions,

one acting by antisepsis, and the other by destruction of the microbe through using up its food supply. Dr. Kane thought that it was in the same train of experiment as that of Dr. Jenner in vaccination being a preventive of small-pox. Mr. Brown said that he had paid considerable attention to the detection of bacilli as a means of determining the character of disease; many who examined the sputa of sick persons were unable to discover the bacillus, failure being due to the instrument used not being suitable for the work, for which an immersion objective should be used. Regarding the staining of these objects, Mr. Brown said he used a diluted solution of borax, drying, coloring with fuchsine and counterstaining blue.

A paper on *aristol* by Mr. Beringer was read, giving a method of its preparation. The paper was accompanied with samples of the product. In reply to a question as to its cost, he stated that he had not figured that out, but that it was much inside of the price of the foreign-made article.

Prof. Remington inquired to what extent the *National Formulary* is made use of by physicians and pharmacists; his own opinion was that it was the most largely used formulary that had been published for a very long term of years, and that it was a great advantage for pharmacists to bring it to the attention of physicians as it would tend to secure greater uniformity in the use of special preparations.

The following prescription had been presented at the last meeting:

Liq. plumbi subacetatis,	℥ss
Ext. Opii., }	
" belladonnæ, }	āā gr. iiss
Ol. theobromæ,	℥iss

M. ft. suppos. vi.

Replies as to the best method of compounding had been received from two pharmacists, one of whom suggested ℥ss lanolin to be used in place of as much butter of cacao, and the other advised the concentration of the lead solution and the increase of the butter of cacao.

Inquiry had been made as to *what extent physicians use the Pharmacopœia;* this was replied to by Mr. W. McIntyre, by some very interesting tabulated statistics, covering 1,000 consecutive prescriptions.

These had been written by 78 physicians in Philadelphia, and called for 386 different drugs or preparations, the total number of items in these prescriptions being 3,393, or on an average a trifle over 3⅓ items for each prescription. Of the drugs ordered, there were 275, or 71·24 per cent. of the total number, recognized by the U. S. Pharmacopœia; 76, or 19·69 per cent. of the whole, published in the National Formulary, the AMERICAN JOURNAL OF PHARMACY, or other readily accessible publications; and only 35, or 9·07 per cent. of the total number, consisted of proprietary, trade-marked and similar preparations. Regarding the proportion of each class to the total number of 3,393 specifications, it had been ascertained that pharmacopœial articles had been ordered 2,979 times, equal to 87·80 per cent. of the total number; non-pharmacopœial and non-proprietary articles 273 times, equal to 8·05 per cent., and proprietary and trade-marked preparations 141 times, equal to 4·15 per cent. of the total number of items.

During the same period, in which these prescriptions had been put up, there had been calls, by customers, without prescriptions, for what are known more

generally as patent medicines, resulting in sales of such for internal use 81 different articles in 1,198 calls, and for external use 45 articles were the basis of 680 sales. Of patented and trade-marked preparations, physicians have used fifteen different articles in forty-six orders.

Several members expressed their gratification at this favorable showing which was greatly to the credit of the physicians who had written these prescriptions, and were evidently not in favor of secrecy in medicinal preparations, but adhered to the Pharmacopœia as a code, and made use of non-pharmacopœial articles—with very few exceptions—only in case the formulas were accessible to all pharmacists.

Mr. Thompson inquired what number of these preparations were his own make, and what number had been purchased ready made? To this Mr. McIntyre replied that all the articles denominated as officinal were his, as far as it was possible to make them, except certain chemicals, or unless he might accidentally be out of some one when he would have to purchase.

Professor Maisch presented some specimens for the museum given to him by our fellow member, Mr. Charles A. Heinitsh, of Lancaster, who has had them for many years, and they represented articles of trade now very rare, viz: *Sir James Murray's fluid camphor*, *Tutia* or prepared tutty (impure oxide of zinc) and *terra sigillata* with the manufacturer's stamps still quite clearly marked on them—the thanks of the College were voted for them to Mr. Heinitsh.

To the query what is *antikamnia*, a reply was given by M. F. Haussmann in a paper read and referred for publication.

After some further discussion, the meeting adjourned.

T. S. WIEGAND,
Registrar.

EDITORIAL.

The meeting of the American Pharmaceutical Association, in New Orleans, will be held in the Washington Artillery Hall, where also room has been secured for the exhibition of articles of pharmaceutical interest. The headquarters of the Association will be at the St. Charles Hotel, where ample accommodations will be provided for the visiting members, at the reduced rate of $3 per day. The Illinois Central Railroad has granted to the members going over their road from either Chicago or St. Louis, tickets for the round trip at a single fare. An analogous liberal concession has been made from Cincinnati by the Queen and Crescent line. For other sections of the country, from which reduced fares could be obtained, the usual convention rates have been allowed, being one fare going, at the same time obtaining from the ticket agent a convention certificate; the latter must be signed in New Orleans by a member of the committee, designated for the purpose, and a return ticket over the same route may then be purchased at one-third regular fare. For members from the Eastern and Central Atlantic States, desiring to travel in a body, it has been proposed, to leave Washington on Thursday, April 23, at 11.10 P.M., by way of the Chesapeake and Ohio Railroad to Cincinnati, arriving there Friday evening; and then to take the Queen and Crescent Line, stopping on the following morning for a few hours with the view of visiting Lookout Mountain, and reaching New Orleans Sunday morning at 8 o'clock.

The meeting promises to be a large and profitable one; we have learned from

several sections in the South that it will be well attended from that part of the country; and while the various states from which members are usually present at the meetings will be well represented, we have also information of projected participation in the proceedings from localities from which heretofore delegates and members could not be present.

OBITUARY.

Charles Christian August Spannagel died suddenly at his residence in Philadelphia on the morning of March 23. He was born at Vlotho, Westphalia, November 16, 1839, as the son of Assistant Judge C. A. Spannagel, and received his first elementary education in a private school. When in 1850 the father became Director of the District Court, at Siegen, Westphalia, Charles entered the schools in that city until in March, 1857, he commenced his apprenticeship in pharmacy with W. Ricke, Apothecary in Oeynhausen, until September, 1860 Subsequently he served as assistant in several pharmacies, and during 1863–64 as military pharmacist in the House of Invalids in Berlin, at the close of which service he continued his studies at the University of Berlin, where Professors Berg and Braun were his instructors in botany and pharmacognosy, Dove in physics, and Schneider, Bammelsberg and Sonnenschein in different branches of chemistry. In December, 1865, he graduated, passing the state's examination with the grade "very good." During the Austrian-Prussian war, in 1866, he acted as field apothecary. He first came to the United States in 1869; but his military service not having been completed at the beginning of the Franco-German war in 1870, he returned to his native country, and was attached as field apothecary first to the 14th army corps, and subsequently to the second field hospital of the third army corps, receiving several medals of honor for faithful service. After the close of the war in 1871 he returned to Philadelphia, and soon after entered into partnership with Mr. G. Radefeld in purchasing the store 1607 Ridge Avenue. His partner dying in the following year, he conducted the business on his own account until the time of his death, maintaining for himself a well-deserved reputation for integrity and reliability. For a number of years his health was impaired from a complication of diseases; calcification of the cardiac valves terminated his life unexpectedly after a brief illness. The deceased was never married; his nearest relatives, the aged parents and his brothers, reside in Germany. He was a member of the Philadelphia College of Pharmacy, and of the American Pharmaceutical Association.

Professor Herod D. Garrison, M.D., died in Chicago, February 23, of Bright's disease, in the fifty-eighth year of his life. He was born in Dearborn County, Indiana, was educated at the Marietta College, Ohio, and studied medicine in Cincinnati. Subsequently, he was engaged in the drug business in Chicago, the store being destroyed in the great fire in 1871. For a few years he held the chair of materia medica in the Chicago College of Pharmacy, when in 1878 he went to Europe, having been appointed honorary commissioner to the Paris exposition. After his return he was again called to one of the chairs in the college named before, teaching physics and chemistry until he resigned last summer. At various times he had also been connected with other institutions as lecturer on chemistry. A widow and three children, the son being a physician, survive him.